FUGRO WEST, INC.

INTERIM CLOSURE ASSESSMENT DELIVERABLE
(File No. 95-066)

Prepared for:
THE DIAL CORPORATION

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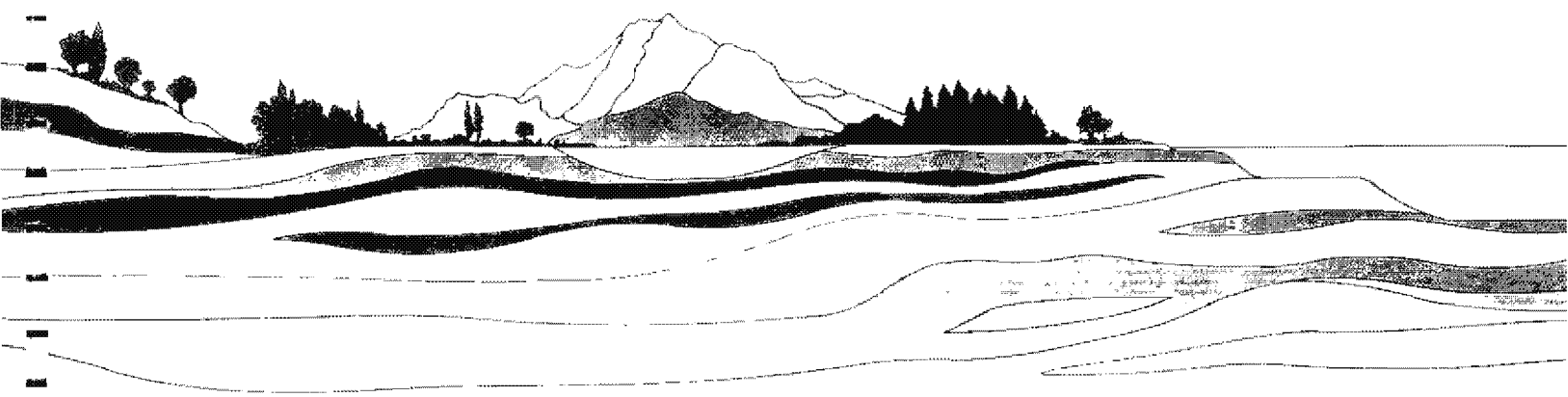

FUGRO

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FUGRO

1.0 INTRODUCTION

This report is provided as an "interim deliverable" to the final closure report for the former Dial Facility at 9300 Rayo Avenue, South Gate, California (Figure 1). The closure sampling and analytical program was conducted from September to October 1996, consistent with the scope and procedures outlined in the EMCON Closure Plan dated June 19, 1996, and the Fugro West, Inc. (Fugro), Closure Plan Addendum's of July 30 and September 9, 1996. The Regional Water Quality Control Board-Los Angeles Region (RWQCB) approved the closure plan dated June 19 and addendum dated July 30, 1996, in a written letter to Dial dated August 8, 1996. The additional addendum was verbally approved by the RWQCB on September 19, 1996. The site buildings and structures have been demolished and site grading was completed by mid-November 1996.

As the majority of the sampling program and removal action has been completed, our objective in presenting this data is to allow the RWQCB to review and approve an additional assessment program for inclusion in the remaining portion of the closure sampling effort, which will be initiated in late December 1996 or early January 1997. Installation of three ground water monitoring wells and four confirmatory soil borings remain to be completed as part of the original closure sampling program.

The analytical data for the closure of sumps, drains, and clarifiers and the underground and aboveground storage tanks is presented to outline areas of concern (AOC) not identified from previous assessments. To provide a basis for identification of the AOCs, analytical data from the closure sampling program was compared to the U.S. Environmental Protection Agency (U.S. EPA) Region IX, Preliminary Remediation Goals (PRGs), and calculations of screening level values as provided in the RWQCB "Interim Assessment and Site Cleanup Guidebook," May, 1996.

To provide a brief report of the data and interpretation of the results, certified analytical laboratory reports and waste manifests are not included in this document and will be provided in the final closure report. This report was prepared using generally accepted environmental consulting principals and practices within the limitations described in Appendix A.

2.0 CLOSURE PROGRAM AND PROCEDURES

The closure sampling program was initiated on September 9, and was completed on October 24, 1996. During that period, 141 soil samples were collected below sumps, drains, clarifiers, underground storage tanks (USTs) and aboveground storage tanks (AGTs) (Tables 1 and 2). Of the total number of samples collected to date, 16 were analyzed to characterize the stockpiled materials generated by the remedial excavations for disposal. Including the previous assessment programs, a total of approximately 400 soil samples will be collected at the completion of the closure sampling program (Tables 1 and 2).

The soil samples were collected at depths between approximately 3 and 16 feet below the ground surface (bgs) beneath the sumps, drains, clarifiers, underground and aboveground tanks identified for closure on Plate 1. Soil samples were collected using either a hand auger (HA-series) or with the aid of the bucket of an excavator. Soil samples were selected for chemical analysis by U.S EPA methods for the following constituents of concern (COC) consistent with the closure sampling schedule (Tables 1 and 2):

- Total Petroleum Hydrocarbons (TPH [C4 to C23+ range]), U.S. EPA method modified 8015(ff);
- Petroleum Aromatic Compounds (Benzene Toluene, Xylenes and Ethylbenzene [BTEX]), U.S. EPA method 8020;
- Volatile Organic Compounds (VOCs), U.S. EPA method 8260;
- Formaldehyde, U.S. EPA method 8315;
- pH, U.S. EPA method 9045;
- Phosphate, U.S. EPA method 365.2m;
- Chloride, U.S. EPA method 300.1;
- Ammonia, U.S. EPA method 350.2m;
- Methylene Blue Active Substances (MBAS), U.S. EPA method 425.1m

Consistent with a RWQCB request made in the field, soil samples O-M and O-SE collected below the sump south of the AGT area east of former Building 8 were analyzed for polychlorinated byphenols (PCBs) by U.S. EPA method 8080. Soil sample locations were tied to surveyed waste management units, AGT areas and building locations. A detailed discussion of sampling procedures and the analytical program for the closure sampling performed to date is provided in Appendix B. The results of the closure sampling program are provided in Tables 3

and 4 and are shown on Figures 2 through 7. A list of abbreviations for the acronyms used in the report is provided in Table 5.

The remaining elements of the closure plan that will be completed once site grading operations have been completed are as follows (Plate 1):

- Exploratory Soil Borings EB-1 and CB-1 through CB-3; and
- Monitoring Wells MW-1 through MW-3.

The analytical results of soil and ground water samples collected from these borings and wells will be presented in the final closure plan. The soil samples collected from these borings will be analyzed for petroleum hydrocarbons and volatile organic compounds. The closure sampling program has been completed for all the formaldehyde, pH, phosphates, chloride, ammonia, and MBAS locations.

Removal of the former Building 8 fuel oil tank and excavation of yellow and white-stained soil, suggestive of low pH conditions, consistent with the workplan addendum of September 9, 1996, was completed by mid-October 1996. Soil removed from the fuel oil tank excavation was transported to the TPS, a treatment, storage, and disposal facility in Adelanto, California. Stockpiled soil removed from the acid-containment area and sump excavations was sampled and later used to backfill these excavations.

3.0 IDENTIFICATION OF AREAS OF CONCERN

To identify areas that may require further evaluation, the analytical results from the closure sampling program were compared to published screening level guidance established to protect human health and ground water. U.S EPA Region IX, PRGs (September 1, 1995) for industrial soils and screening level values derived using the attenuation factor method described in the RWQCB May 1996, "Interim Assessment and Site Cleanup" Guidebook were used as guidance to compare with the closure analytical data.

As provided by the U.S. EPA (September 1, 1995), Region IX PRG combine current U.S. EPA toxicity values with "standard" exposure pathways to estimate concentrations of COCs in the environmental media (i.e., soil, ground water and air) that are protective of humans, including sensitive receptors. The PRG levels correspond to either one-in-one million (10^{-6}) cancer risk or a noncarcinogenic hazard quotient of one, whichever is less. According to the U.S. EPA Region IX, PRGs can be used to screen COCs in the environmental media and trigger further investigation. Because of the certain disposition and redevelopment of the property, industrial soil PRGs were compared with closure data gathered to date.

The screening level guidance established by the RWQCB (May 1996), is based on attenuation of the COCs in the soil media and their separation above a ground water resource. To establish a screening level estimate, the retention and transportation of volatile and petroleum compounds through the soil media and their separation from the water table and the beneficial use of the ground water is considered. A screening level estimate for VOCs and chloride, formaldehyde, ammonia and MBAS was derived by multiplying the State of California Maximum Contaminant Level (MCL) for a COC by its attenuation factor, which is based on the lithologic makeup of the soil column and the distance separating the COCs from the water table. Screening level values for hydrocarbons and BTEX compounds were derived from interpolation of prescribed RWQCB values contained in Table 4-1, "Maximum Screening Levels (mg/kg) for TPH and BTEX Above Drinking Water Aquifers." Table 5-1, "Average Attenuation Factors for Different Distances Above Ground Water and Lithology" and the methods described in the RWQCB May 1996 document were used to establish the screening levels for the COCs presented in the table on the next page.

The screening level estimates were calculated using a depth to ground water of 45 feet bgs and a separation of 30 feet between the COCs and the water table. Since most of the soil samples were collected at depths between 3 and 15 feet bgs (see Tables 3 and 4), a distance of 30 feet between the COCs reported in the soil samples and the water table is a conservative separator estimate. In calculating the attenuation factor, the soil makeup separating the COCs and the ground water was interpreted to be 50 percent sand and 50 percent clay. Boring logs for exploratory soil borings drilled in support of the risk assessment were used, along with logs from

previous assessment programs (see Appendix D for recent logs). Linear interpolation of the published criteria on Table 4-1 and 5-1 were used to establish and attenuation factor for a 30-foot separation and establish the screening level estimates for the petroleum hydrocarbons. Screening level estimates were only provided for those VOCs that were reported by the laboratory in the soil samples collected during the closure sampling performed to date.

A detailed presentation of the calculations and assumptions used to establish screening levels is provided in Appendix C.

The 1,2,4 and 1,3,5 trimethybenzene (TMB) have no published toxicity information or State MCL from which to draw a PRG or calculate a screening level value. An approximation of the MCL of 1.75 µg/l was used in the screening level calculations for TMB. This value was selected because of the molecular resemblance of TMB to xylene, and the assumed similar structure activity.

COC	Maximum Contaminant Level (State) (mg/L)	Attenuation Factor	RWQCB Screening Level (mg/kg)	Industrial Soil PRG (mg/kg)
TPH C4 to C12			500	
TPH C13 to C22			1,000	
TPH C23+			10,000	
Benzene	0.001		0.054	3.2
Toluene	0.100		2.75	2800
Xylenes	1.75		10.7	690
Ethylbenzene	0.680		29	990
Chloroform	0.100	10.75	1.75	1.1
Methylene Chloride	0.005	10.75	0.054	25
1,2,4 Trimethyl-benzene	1.75	10.75	18.8	
1,3,5 Trimethyl-benzene	1.75	10.75	18.8	
Formaldehyde	5.5*	10.75	59	100,000
pH	6.5 to 8.5	10.75		<2 or >12.5***
Phosphate		10.75	None	
Chloride	250**	10.75	2,688	
Ammonia	45****	10.75	484	100,000
MBAS	0.5	10.75	5.4	

* The value for Formaldehyde is the PRG for tap water of 5.5 E4 µg/L.
** The values for Chloride and MBAS are secondary State of California MCLs.
*** The value for pH is the criteria for identification as a hazardous waste by 22 CCR, 66261.22.
**** The MCL for ammonia is as Nitrate (NO_3)

4.0 CLOSURE PROGRAM RESULTS

4.1 Petroleum Hydrocarbons

Sixty-eight (68) soil samples were collected beneath selected USTs, AGT areas, clarifiers, sumps and drains for analysis of petroleum hydrocarbon content by U.S EPA method 8015(ff). Hydrocarbons in the C_{13} to C_{22} range were the most frequently reported in the soil samples analyzed (Tables 3 and 4). C_{13} to C_{22} petroleum hydrocarbon concentrations ranged from near the practical quantitation limit of 0.5 mg/kg to 3,200 mg/kg. Concentrations in excess of the screening level value of 1,000 mg/kg were reported in soil samples HA-7 and HA-2, collected below the former alkane tank near the storm water retention area and the oil storage area within former Building 6, respectively (Figure 2). Gasoline range (C_4 to C_{12}) hydrocarbons were not reported above 1.8 mg/kg, and with the exception of the sample from HA-2, "high boiling point" hydrocarbons (C_{23+}) were not reported above 210 mg/kg in the closure samples analyzed.

4.2 Petroleum Aromatic Compounds

A total of 11 soil samples were collected and analyzed for BTEX compounds below the former Building 8 tank, former 100-gallon gasoline storage tank and the storm-water retention area (Plate 1). With the exception of the west side wall sample collected for closure of the building 8 tank, no BTEX compounds were reported above laboratory practical quantitation limits. The "west" sidewall sample collected at a depth of 10 feet bgs from the Building 9 tank excavation contained a total xylenes concentration of 0.017 mg/kg. No soil samples that were collected contained BTEX concentrations above the screening level estimates or PRGs.

4.3 Volatile Organic Compounds

A total of 19 soil samples were collected beneath selected sumps, drains, clarifiers and AGTs and analyzed for volatile organic compounds by U.S EPA method 8260 (Figure 3). Chloroform and methylene chloride were reported in four soil samples collected below the clarifier between Building 2 and 14 and along the drain line due west of the former "chlorimide system" and AGT area I at concentrations ranging between 0.012 and 0.110 (Figure 3). The 1,2,4 and 1,3,5 TMB were reported at concentrations of 0.650 and 0.190 mg/kg, respectively in soil sample R-1 collected below the west end of the main gate clarifier at a depth of 16 feet bgs (Figure 3). None of the VOCs reported in these soil samples exceeded either their PRG or calculated screening level value (Tables 3 and 4).

4.4 Formaldehyde

Tests for formaldehyde (HCHO) were performed on 11 soil samples collected from AGT Area V and from along the trench drain adjacent to the former chlorimide system and AGT Area I (Figure 4). Formaldehyde was reported in samples collected from the AGT Area V due east of

former building 8 at concentrations ranging from 2.9 to 50.1 mg/kg (Table 4). One soil sample VD.3, collected below a sump adjacent to the former "chlorimide system" contained formaldehyde at a reported concentration of 2.7 mg/kg. The method blanks for the samples collected contained formaldehyde at concentrations of 1.3 and 1.5 mg/kg. None of the samples analyzed contained formaldehyde concentrations in excess of the PRG of 100,000 mg/kg or the screening level estimate of 59 (Tables 3 and 4).

4.5 pH

pH was the most frequently tested analyte below the sumps, drains, clarifiers and AGT areas (Figure 5). A total of 86 soil samples were collected and tested for pH. The majority of the pH values ranged between 7 and 9 with six soil samples containing values below 5 or equal to or above 10 (Tables 3 and 4). S-2 collected at a depth of 3 feet bgs during the removal action in the acid containment area contained a reported pH of 4.3. This affected soil was removed to a depth of 5 feet bgs. Confirmatory soil sample S-5 collected below and north of S-2 contained a pH of 7.8. The soil sample (HA-10) with the highest pH (11.6) was collected at a depth of 5 feet bgs adjacent to the former caustic unloading sump (Figure 5). pH values over 10 were reported in soil samples collected below the main gate clarifier (R-1), brine tank (BT-B) caustic unloading sump (J-S) and spray dryer area and building 5 (L). None of the pH values reported exceed CCR Title 22 criteria (section 66261.22) for classification of a waste as hazardous by characteristics.

4.6 Phosphate, Chloride and Ammonia

Phosphate was analyzed for in 14 soil samples collected as part of the closure program. The reported phosphate concentrations in these samples ranged from 1.4 to 6.9 mg/kg (Tables 3 and 4).

Twenty-six (26) soil samples were analyzed for ammonia by U.S EPA method 350.2 (Tables 3 and 4). Reported ammonia concentrations in these samples ranged from 28 to 470 mg/kg. The highest concentrations were reported in soil samples (AV-A and AV-E) collected from AGT Area V "detergent area" east of former Building 8. None of the sample concentrations reported exceed the PRG of 100,000 mg/kg for ammonia. Sample AV-A contained an ammonia concentration near the screening level estimate of 484 mg/kg.

Fifty-seven (57) soil samples were analyzed for chloride by U.S EPA method 300.1 (Tables 3 and 4). The majority of the samples were collected below AGT areas I, IV, and V and the main clarifiers and drains in Building 5 and adjacent to the former "chlorimide system" (Figure 6). Chloride concentrations above 1,000 mg/kg and at or above the screening level were reported in samples AI-A, AIV-C, AV-C and V-SM (Figure 6).

4.7 Methylene Blue Active Substances

Soil samples collected below the AGT Areas V, VI and VIII and the main clarifiers, sumps and drains were tested for MBAS by U.S EPA method 425.1M (Figure 7). MBAS concentrations ranged from 1.3 to 1,600 mg/kg and were the highest in samples collected in the AGT Area V "detergent area," AGT Area VIII "stormwater retention area" and samples S and H.1 collected below the clarifier north of AGT area VIII and drain between building 4 and 7, respectively. The majority of the soil samples analyzed contained MBAS concentrations in excess of the screening level criteria of 5.4.

5.0 CONCLUSIONS

5.1 General

- Preliminary remediation goals (U.S. EPA September 1995) designed to establish concentrations of COCs in soil that would be protective of human health at an industrial site were not exceeded in any soil sample analyzed.
- RWQCB screening level estimates calculated to be protective of shallow ground water were only exceeded in two soil samples collected at a depth of 5 feet bgs for petroleum hydrocarbons (C_{13} to C_{22} range) and two soil samples collected for analysis of chloride.
- Additional assessment is needed locally in areas where chloroform, TMB, formaldehyde, ammonia, and MBAS were reported slightly below screening level criteria to confirm calculation assumptions and the separation to ground water.

5.2 Petroleum Hydrocarbons

- The majority of petroleum hydrocarbons reported in the soil samples collected as part of the closure program are within the carbon range of C_{13} to C_{22} or "diesel" range. Two soil samples (HA-2 and HA-7) collected at a depth of 5 feet bgs exceed the screening level criteria for petroleum hydrocarbons in this hydrocarbon range. The vertical extent of hydrocarbons at concentrations above the criteria has not be delineated in the area of samples HA-2 and HA-7.
- The petroleum hydrocarbons reported in the C_{13} to C_{22} range are consistent with the reported range for alkane oil and dodecylbenzene. Hydrocarbon concentrations greater than 100 mg/kg were generally reported in soil samples collected in the area of the alkylate unloading sump (Clarifier samples S and Sw) and below the stormwater retention area (AGT Area VIII), where known impacts have been identified by previous assessments. Additionally, elevated C_{13} to C_{22} range hydrocarbons concentrations were reported in one soil sample each in AGT Area V and Building 8 where alkane (or alkylate) oils were stored or used in the manufacturing process.
- The hydrocarbons identified from samples collected in Building 8 (AIV-C) and AGT Area V (AV-A) appear to be a localized release through a former sump or drain into the subsurface. The petroleum hydrocarbons identified in soil samples collected below the stormwater retention area (AGT Area VIII) and clarifier appear to be related to alkylate-impacted soils identified from previous investigations of the unloading sump or could possibly be related to a release from the piping leading

from the unloading sump to the alkane tank. All these samples collected at depths of between 3 and 5 foot bgs are below the regulatory criteria of 1,000 mg/kg.

- Petroleum hydrocarbons reported in soil samples collected for the closure of the former Building 8 fuel oil tank were lower than previously reported samples from this area. The concentrations reported in these samples indicate that no further assessment or remediation is warranted in this area, and the UST site can be closed.

5.3 Petroleum Aromatic Compounds

- Benzene, toluene and ethylbenzene were not reported in any of the samples analyzed. Xylene was reported in one sample collected as part of the Building 8 tank closure operation at a concentration well below the screening level criteria. With the exception of the additional sampling required for the remainder of the closure program, the assessment of BTEX in the soils beneath the site is completed.

5.4 Volatile Organic Compounds

- Chloroform was reported in three soil samples collected below the clarifier between former Buildings 2 and 14 and in a soil sample collected below a sump within the "chlorimide system" containment (AGT Area I) at concentrations below the PRG and screening level criteria. The low concentrations in the soil in this area are similar to those reported in soil samples collected as part of previous investigations (EMCON borings B-1, B-46 and B-50) (Plate 1). The vertical extent of the soil impacts appear to be minor as suggested by the historic absence of chloroform in ground water samples collected from wells MW-6 and MW-7. The installation of monitoring well MW-11 downgradient from these sample locations should provide a better assessment of chloroform impacts on shallow ground water in this area.

- Methylene chloride was reported at low concentrations below the PRG and screening level criteria. Methylene chloride has not been reported in soil or ground water samples from previous investigations and as such is anomalous. Although not reported in the laboratory method blanks, methylene chloride is a common laboratory contaminant and its presence in the environment should be confirmed through additional soil sampling.

- The low concentrations of 1,2,4 and 1,3,5 TMB reported in closure sample below the main gate clarifier are anomalous and have not been reported in soil or ground water samples analyzed from previous assessment programs. Their presence in the soil should be confirmed by additional soil sampling below the main gate clarifier.

5.5 Formaldehyde

- Formaldehyde was reported in several soil samples collected within the AGT Area V at low concentrations well below the PRG and slightly below the screening level criteria. The highest concentrations were reported in soil samples collected adjacent to the former formaldehyde storage tanks and the sump due south of the tanks. Because of the presence of formaldehyde in the method blanks and its natural presence within the environment, soil samples with concentrations below 3 mg/kg should be considered background. Additional sampling appears warranted to assess the vertical extent of the sample with the highest formaldehyde concentration (AV-B) and the separation from ground water in this area.

- The presence of formaldehyde in the soil sample VD.3 (2.7 mg/kg) collected within and subadjacent to the "chloromide system" is near the method blank concentration of 1.5 mg/kg and probably is not indicative of a release in this area. Further, the source of the formaldehyde within the "chloromide system containment area" is not consistent with its reported use at the site.

5.6 pH

- With the exception of six soil samples collected beneath the site, the pH in site soils generally range from 7 to 9.5. Five soil samples with pH values equal to or over 10, indicating alkaline conditions were collected below areas where alkaline materials were stored or managed (caustic unloading sump, soda ash unloading sump and spray dryer sump) or below waste management units (main gate clarifier and brine tank). The sample collected adjacent to the caustic unloading sump (HA-10) contained the highest pH in the soil at 11.6.

- The low pH reported in soil sample S-2 (4.3) and subsequent confirmatory soil sample S-5 and pH (7.8) collected at the conclusion of removal operations, indicates that low-pH soils were excavated. The shallow depth of the confirmatory soil sample of 5 feet bgs indicates the affected soil was limited in vertical extent below the former acid tank containment area.

- Local elevated pH conditions in the soil do not appear to have affected the shallow ground water beneath the site. Historically, field pH measurements of ground water samples collected have not been above 9, and frequently range form 7 to 8.

5.7 Phosphates, Chloride and Ammonia

- The samples analyzed for phosphate contained concentrations that are not significant or above what may be expected to occur naturally in native soils. Samples analyzed for ammonia contained concentrations well below the industrial PRG and were below the screening level estimate. The one exception is the sample collected from within AGT Area V (AV-A) which contained a ammonia concentration of 470 mg/kg which approached the screening level estimate of 484 mg/kg. Further assessment in this area should be performed to document the separations and depth of ammonia in this area.
- Chloride was reported at concentrations above the screening level criteria in two soil samples collected below the former "chlorimide system" (AGT Area I). Chloride was also reported in two soil samples collected from AGT Areas IV and V at concentrations near screening level criteria. The remaining samples analyzed for chloride are well below the screening level criteria.
- Ground water samples collected from well MW-11, to be installed less than 50 feet south of the samples, should provide an assessment of the effect of elevated chloride concentrations in the shallow soil in the ground water in this area.

5.8 Methylene Blue Active Substances

- The majority of MBAS samples collected as part of the closure program exceed the screening level criteria of 5.4 mg/kg. The highest concentration of MBAS (1,600 mg/kg) was reported in AGT Area V "detergent area" in soil sample AV-A. The occurrence of and the effect of MBAS reported in the shallow soil on the ground water has not be evaluated by the assessment or closure programs completed to data. Inclusion of this analyte in future water quality assessments should be performed.

6.0 RECOMMENDATIONS

An assessment program to close the data gaps identified by the closure sampling performed to date is recommended as follows:

- Further define ground water conditions. Amend to ground water analysis program to include ammonia and MBAS for the initial round of ground water sampling following installation of the new monitoring wells MW-11 through MW-13. Sample all the ground water monitoring wells on the site following installation of the new wells. Relocate well MW-11 to the north to be more proximal to the sampling locations in the "chlorimide system containment area" that contained chloride concentrations in excess of screening level criteria.
- Drill two exploratory soil borings using Geoprobe® equipment in AGT Area V and soil samples AV-A and AV-B to assess the vertical extent of ammonia and MBAS and formaldehyde, respectively. Drill the borings to a depth of 20 feet bgs and collect soil samples at 5-foot-depth intervals to the total depth of each boring.
- Drill one exploratory soil boring using either hollow-stem auger or Geoprobe® equipment to a depth of 45 feet bgs through the former location of the clarifier between buildings 2 and 14 and closure samples Q-W and Q-E. Collect the soil samples at five-foot-depth intervals to the total depth of this boring to assess the vertical extent of chloroform and confirm the presence of methylene chloride in this area.
- Relocate boring EB-1 so it will extend through the west end of the former main gate clarifier and closure sample R-1. Amend the sampling program for VOCs by U.S. EPA method 8260 to include 1,2,4 and 1,3,5 TMB.
- Drill one exploratory boring each using Geoprobe® equipment through closure sample locations HA-2 and HA-7 to a total depth of 20 and 35 feet bgs, respectively. Collect soil samples at 5-foot-depth intervals to the total depth of each boring for analysis of hydrocarbon content by U.S EPA method modified 8015(ff) to assess the vertical extent of petroleum hydrocarbons identified in this area.

Five (5) exploratory soil borings are proposed in addition to the remaining closure sampling to assess the extent of COCs identified in these AOCs identified from closure sampling performed to date (Figure 8). The additional assessment procedures and analytical methods for the COCs will follow those outlined in the EMCON Closure Plan and Fugro Addendums. Additional assessment procedures that are different from those provided previously are included in Appendix E.

TABLE 1
CLOSURE SAMPLING SCHEDULE
Sumps, Drains and Clarifiers

LOCATION	Phase II, III and IV Assessment Sampling Points	Number of Soil Samples Analyzed Phase II -IV Assessments	Phase II, III and IV Asessment Analytes											Closure Sampling Points	Number of Soil Samples Analyzed for the Closure Program	Closure Program Analytes									Assessment and Closure Samples Analyzed (1) (total)
			TPH-FC Method 8015FC	BTEX Method 8020	VOCs Method 8010	Form. NASCI 487	PCBs Method 8080	pH Method 9045	Metals Method 6/7000	Total Cr. Method 7190	Phosphate Method 300.1	Chloride Method 300.1	Phenol Sample Screen			TPH-FC Method 8015FC	BTEX Method 8020	VOCs Method 8260	Form. Method 8315	pH Method 9045	Phosphate Method 365.2	Chloride Method 300.1	Ammonia Method 350.2	MBAS Method 425.1	
SUMPS																								
Pump sump next to the NW Corner of Bldg. 2 and the bleach tank.	B-3	1	X					X						A	None									1
Polycrum sump, NE corner of BLDG. 2	B-4 and S-2	1,1	X		X	X		X					X	B, HA-9	1			X						3
Sump east of Bldg. 4 and old cooling tower	B-11	1						X		X				C.1	1							X		2
Drain sump by Bldg. 15	B-13	1	X			X								D	1	X		X						2
Alkane unloading sump	B-15, B-22, B-23,B-24, B-41, B-42 B-53 and H-1	1,8,8,8,5,5,5,1 total of 41	X											E	None									41
Sump due South of BLDG. 4 and North of RR tracks	B-16	2	X					X			X			F	None									2
Sump within Area III, Oleum AGT Containment area	B-17	1						X						G-1	1				X	X	X		X	2
Sump east of Bldg. 1 and north of Area II AGTs	None													B1-H	1						X			1
Pump sump NW corner Bldg. 2 chlorine tank	None													CT-I	1						X			1
Soda Ash Unloading Sump between Bldgs. 4 and 8	S-15	1						X			X	X		JN and JS	2				X					3
Bldg. 5 Spray Dryer and main sump	None													K,L, and M	3				X				X	3
Sump north of Area V, AGTs and adjacent to weigh station	S-12	1			X	X								S-N.3	1	X			X		X	X		2
Sump south of Area V, AGTs. Drainage Sump for Area V	S-11	1	X				X							O-M and O-SE	2	X (2)			X		X	X		3
Sump inside Bldg. 8, NE Corner	None													SP.A and SP.3	2	X			X		X	X		2
Sump inside Bldg. 5 Boiler Room	None													ZZ	1								X	1
Sump inside Bldg. 8, Central next to Oleum Tanks	S-10	1	X					X			X	X		ZX-1, ZX-2, ZX-3 ZX-4	4				X					5
Caustic Unloading Sump Due North of Bldg. 6	S-7	1												HA-10	1									2
CLARIFIERS																								
Clarifier between Bldgs. 2 and 14	B-1	1	X		X	X	X	X		X	X	X		Q-E and Q-W	2			X						3
Main Clarifier preceeding	B-9	1	X					X						R1 and R2	2	X		X	X	X	X		X	3

TABLE 1
CLOSURE SAMPLING SCHEDULE
Sumps, Drains and Clarifiers

LOCATION	Phase II, III and IV Assessment Sampling Points	Number of Soil Samples Analyzed Phase II -IV Assessments	Phase II, III and IV Assesment Analytes: TPH-FC Method 8015FC	BTEX Method 8020	VOCs Method 8010	Form. NASCI 487	PCBs Method 8080	pH Method 9045	Metals Method 6/7000	Total Cr. Method 7190	Phosphate Method 300.1	Chloride Method 300.1	Phenol Sample Screen	Closure Sampling Points	Number of Soil Samples Analyzed for the Closure Program	Closure Program Analytes: TPH-FC Method 8015FC	BTEX Method 8020	VOCs Method 8260	Form. Method 8315	pH Method 9045	Phosphate Method 365.2	Chloride Method 300.1	Ammonia Method 350.2	MBAS Method 425.1	Assessment and Closure Samples Analyzed (1) (total)
sewer discharge, south gate																									
Clarifier near storm water retention tanks	B-14	1	X		X		X	X						S and Sw	2	X		X		X	X	X		X	3
Clarifier southeast corner of Bldg. 15	B-13	1	X			X								T	2	X		X							3
Clarifier east of Bldg. 8	None													U-1, U-2, U-3	3	X				X		X	X		3
DRAINS																									
Trench drain between Bldgs. 1 and 14	B-2	1						X		X	X	X		V-N, V-NM, V-SM V-S, and VD.3	5			X	X			X	X		6
Drain east of Area V, AGTs and the Formaldehyde tanks	B-25	1	X		X	X	X	X						W	None										1
Sump east of Bldg. 4 and old cooling tower	B-11	1						X		X				X-1.3	1								X		2
Storm drain near south gate	None													Y.3	1			X		X					1
Storm drains outside of Bldg. 6	None													Z.3,A1,B1,and C1	4	X				X		X		X	4
Storm drains southwest of Bldg. 1	None													DI-1 and EI-1	2					X		X			2
Storm drains north of Bldg. 7	None													F1,G1,H1 and GH.3	4					X	X			X	4
Bldg. 5 floor drain	None													I1-A, I1-B, I1-C I1-D	4					X		X		X	4
Bldg. 8 trench drain	None													J1-N, J1-M, J1-S	3	X				X		X	X		3
Storm drain east of Bldg. 14	None													K1	1					X		X			1
CLOSURE EXCAVATION STOCKPLIES																									
Clarifier Between Bldg 2 and 14 (Closure Samples QE and QW)														K-1,K-2,K-3,K-4 (3) (composite)	1										
Main Clarifier preceeding sewer discharge, south gate (Closure Samples R-1 and R-2)														R-SP 1, 2, 3, 4 (3) (composite)	1	X		X		X	X			X	
Sump inside Bldg. 8, Central next to Oleum Tanks (Closure Sample ZX)														ZX-SP-1	1					X					
Sump within Area III, Oleum AGT Containment area (Closure Sample G)														G-SP-1	1					X					
														CLOSURE TOTALS	62	23		17	5	44	10	33	18	22	119

NOTES

Refer to Drawing 2 for sample locations.

TABLE 1
CLOSURE SAMPLING SCHEDULE
Sumps, Drains and Clarifiers

LOCATION	Phase II, III and IV Assessment Sampling Points	Number of Soil Samples Analyzed Phase II -IV Assessments	Phase II, III and IV Assesment Analytes											Closure Sampling Points	Number of Soil Samples Analyzed for the Closure Program	Closure Program Analytes									Assessment and Closure Samples Analyzed (1) (total)
			TPH-FC	BTEX	VOCs	Form.	PCBs	pH	Metals	Total Cr.	Phosphate	Chloride	Phenol			TPH-FC	BTEX	VOCs	Form.	pH	Phosphate	Chloride	Ammonia	MBAS	
			Method 8015FC	Method 8020	Method 8010	NASCI 487	Method 8080	Method 9045	Method 6/7000	Method 7190	Method 300.1	Method 300.1	Sample Screen			Method 8015FC	Method 8020	Method 8260	Method 6315	Method 9045	Method 365.2	Method 300.1	Method 350.2	Method 425.1	

ALL Methods shown are U.S. EPA Methods unless otherwise listed.
Descriptions of Sample Location and Collection Procedures for Phase II, III, and IV Assessment Samples can be Found in EMCON August 5, 1992, "Phase II and Phase III Subsurface Assessment Report".

TPH-FC = Total Petroleum Hydrocarbons, Fuel Fingerprint
BTEX = Benzene, Toluene, Ethylbenzene and Xylenes.
VOCs = Volatile Organic Compounds with emphasis on Chlorinated compounds
Form = Formaldehyde
PCBs = Polychlorinated Biphenols
Metals = 22 CCR Metals
Total Cr. = Total Chromium
Phenol = Phenol phthalein
MBAS = Methylene Blue Active Substances

(1) Includes Assessment samples collected subadjacent to and the Closure samples collected below the sumps , drains and clarifiers
(2) Sample additionally analyzed for PCBs by U.S EPA Method 8080.
(3) Stockpile samples from remedial excavation activites were additionally analyzed for 22 CCR metals and Total Recoverable Petroleum Hdyrocarbons (TRPH), by U.S EPA Methods 6000/7000 series and 418.1

TABLE 2
CLOSURE SAMPLING SCHEDULE
Underground- and Above-Ground Tanks and Areas of Concern

LOCATION	Phase II, III and IV Assessment Sampling Points	Number of Soil Samples Analyzed Phase II -IV Assessments	Phase II, III and IV Assessment Analytes: TPH-FC Method 8015FC	BTEX Method 8020	VOCs Method 8010	Form. NASCI 487	PCBs Method 8080	pH Method 9045	Metals Method 6/7000	Total Cr. Method 7190	Phosphate Method 300.1	Chloride Method 300.1	phthalein Sample Screen	Closure Sampling Points	Number of Soil Samples Analyzed for the Closure Program	Closure Program Analytes: TPH-FC Method 8015FC	BTEX Method 8020	VOCs Method 8260	Form. Method 8315	pH Method 9045	Phosphate Method 365.2	Chloride Method 300.1	Ammonia Method 350.2	MBAS Method 425.1	Assessment and Closure Samples Analyzed (1) (total)
Underground Tanks																									
Former Diesel Tank next to Firestone Blvd. (10,000 gal.)	B-6	1	X		X									None											1
Former Alcohol Storage Tank south of Bldg 15. (12,000 gal.)	B-12	1	X											None											1
Former 100-gal Fuel Storage Tank below the 150,000 gallon water tank	S-5	1						X						HA-1	1	X	X								2
Former #2 Fuel Oil Tank below the SW corner of Bldg. 8 (4,200 gal.)	B-16, B-29, B-43	2,8,10	X	X										1A, 1B, North South, East, West	6	X	X								26
Former Fuel (gasoline) Tanks adjacent to the Old Laboratory and Garage (10,000 and 550 gal.)	B-5 ,B-26, B-27, B-28 B-44, B-45, B-46, B-47, B-48, B-49, B50 H-44-1,H-45-1	1,10,10,10 10,10,10,10 10,10,10 1,1	X		X									CB-1, CB-2, CB-3	30	X	X	X							133
Former Diesel Tank, South-eastern corner of the Site (10,000 gal.)	B-52	5	X											None											5
Former Bone Tank between RR tracks and west of Caustic Unloading Area (??????? gal.)	B-8	1						X						BT-A and BT-B	2	X				X	X	X			3
Former Acid Tank Containment, west of Bldg 8	B-17	1						X						B-1,B-2,B-3,B-4 S-1,S-2,S-3,S-4 S-5	9					X					10
ABOVE-GROUND TANKS																									
AREA I - "Chloramide System" Tanks east of Building 1. (Tanks 1-5, Drawing 2)	B-2	1						X	X	X	X			AI-A and AI-B	2							X			3
AREA II - "Raw Material Storage" Tanks west of Bldg. 8 (Tanks 9 -16, Drawing 2)	S-14	1						X	X					AII-A and AII-B	2					X			X		3
AREA III - Oleum Tanks west of Bldg. 8, (Tanks 7 and 8, Drawing 2)	B-17	1						X						AIII-A and AIII-B	2					X					3
AREA IV - "Suffocation Area", inside Bldg. 8, (Tanks 17-28, Drawing 2)	S-9 and S-10	2	X					X			X	X		AIV-A, AIV-B, AIV-C, AIV-D AIV-E, AIV-F	6	X				X		X			8
AREA V - "Detergent Area", Above ground tank farm east of Bldg. 8 (Tanks 29 -46, Drawing 2)	S-13	1						X			X	X		AV-A, AV-B, AV-C AV-D, AV-E, AV-F	6	X			X	X		X	X	X	7
AREA VI - "Silo Storage", east of Bldg 5, (Tanks 51- 56, Drawing 2)	None													AVI-A and AVI-B	2					X		X			2
AREA VII - "Product Storage" inside Bldg 5 "Spray Dryer", (Tanks 57 - 70, Drawing 2)	None													AVII-A, AVII-B AVII-C, AVII-D AVII-E	5									X	5

TABLE 2
CLOSURE SAMPLING SCHEDULE
Underground- and Above-Ground Tanks and Areas of Concern

LOCATION	Phase II, III and IV Assessment Sampling Points	Number of Soil Samples Analyzed Phase II -IV Assessments	Phase II, III and IV Asessment Analytes											Closure Sampling Points	Number of Soil Samples Analyzed for the Closure Program	Closure Program Analytes									Assessment and Closure Samples Analyzed (1) (total)
			TPH-FC Method 8015FC	BTEX Method 8020	VOCs Method 8010	Form. NASCI 487	PCBs Method 8080	pH Method 9045	Metals Method 6/7000	Total Cr. Method 7190	Phosphate Method 300.1	Chloride Method 300.1	phthalein Sample Screen			TPH-FC Method 8015FC	BTEX Method 8020	VOCs Method 8260	Form. Method 8315	pH Method 9045	Phosphate Method 365.2	Chloride Method 300.1	Ammonia Method 350.2	MBAS Method 425.1	
AREA VIII - "Stormwater Retention Area", SE corner of the Site, (Tanks 47 - 50, Drawing 2)	None													AVIII-N, AVIII-NM AVIII-MS, AVIII-S	4	X	X	X		X	X	X		X	4
Former Fuel Oil and Alkane Oil Tanks west of "Storm-water Retention Area", (Tanks 0223 and 0224)	B-10	1	X											HA-7 and HA-8	2	X									3
Former Cooling Tower west of the central water tank and Bldg 4 (15,000 gal.)	S-6	1						X		X				None											1
Former Caustic Tanks west Bldg. 4	S-4	1						X						None											1
Former Chlorine Tanks inside Bldg. 3	S-7	1						X			X	X		None											1
AREAS of CONCERN or NEEDING ADDITIONAL ASSESSMENT																									
Lube Oil Storage Area inside Bldg 6	None													HA-2	1	X									1
Oil Stained Area South Wall Bldg 8.	None													HA-3 and HA-4	2	X									2
Oil Stained Area South Wall SE corner Bldg. 6	None													HA-5	1	X									1
Oil Stained Area inside old Compressor Room SE Corner Bldg. 6	None													HA-6	1	X									1
Main Clarifier at the South Gate Preceeding the Sewer Discharge	B-9	1	X					X						EB-1	10	X		X							11
Equipment Cleaning Pad north side of Building 14 and the adjacent Clarifier	S-1	1	X		X		X							None											1
Drum Fluid Dispensing Area NW Corner of Bldg 2, Lab	S-2	1	X											HA-1	1	X	X								2
Maintenance Area inside Bldg 2 Lab and garage	S-3, B-30, B-31, B-32	1,1,1,3	X		X				X					None											10
Oil Compressor outside Bldg 7	S-8	1	X											None											1
CLOSURE and EXCAVATION STOCKPILES														Note: stockpile samples are composites											
AREA V Soil Stockpiles from closure of Sumps within the AGT containment (Closure samples AV-A through AV-F)														N-1,N-2 (2),NSP	2	X			X	X		X	X	X	
														E-1,E-2,E-3 (2),ESP	2	X			X	X		X	X	X	
														W-1,W-2,W-3,MSP	2	X			X	X		X	X	X	
														S-1,S-3,S-3,S-4 (2)	1										
														SSP	1	X			X	X		X	X	X	
Brine Tank Soil Stockpile (Closure Samples BT-A														BT-1,BT-2,BT-3 BT-4	4	X	X								

TABLE 2
CLOSURE SAMPLING SCHEDULE
Underground- and Above-Ground Tanks and Areas of Concern

LOCATION	Phase II, III and IV Assessment Sampling Points	Number of Soil Samples Analyzed Phase II -IV Assessments	Phase II, III and IV Asessment Analytes											Closure Sampling Points	Number of Soil Samples Analyzed for the Closure Program	Closure Program Analytes									Assessment and Closure Samples Analyzed (1) (total)
			TPH-FC ! Method 8015FC	BTEX Method 8020	VOCs Method 8010	Form. NASCI 487	PCBs Method 8080	pH Method 9045	Metals Method 6/7000	Total Cr. Method 7190	Phosphate Method 300.1	Chloride Method 300.1	phthalein Sample Screen			TPH-FC Method 8015FC	BTEX Method 8020	VOCs Method 8260	Form. Method 8315	pH Method 9045	Phosphate Method 365.2	Chloride Method 300.1	Ammonia Method 350.2	MBAS Method 425.1	
and BT-B) Acid Containment Area (Closure and Remedial Excavation Samples B-1 through B-5 and S-1 through S-5)														ST-1 and ST-2	2					X					
														CLOSURE TOTALS	109	81	46	44	10	37	6	26	12	19	252

NOTES

Refer to Drawing 2 for sample locations.
ALL Methods shown are U.S. EPA Methods unless otherwise listed.
Descriptions of Sample Location and Collection Procedures for Phase II, III, and IV Assessment Samples can be Found in EMCON August 5, 1992, "Phase II and Phase III Subsurface Assessment Report".

TPH-FC = Total Petroleum Hydrocarbons, Fuel Fingerprint
BTEX = Benzene, Toluene, Ethylbenzene and Xylenes.
VOCs = Volatile Organic Compounds with emphasis on Chlorinated compounds
Form = Formaldehyde
PCBs = Polychlorinated Biphenols
Metals = 22 CCR Metals, Title 22 California Code of Regulations Chapter 2 Article 11
Total Cr. = Total Chromium
pithalein = Phenol phthalein
MBAS = Methylene Blue Active Substances

(1) Includes Assessment samples collected subadjacent to and the Closure samples collected below the sumps , drains and clarifiers
(2) Stockpile samples from remedial excavation activites were additionally analyzed for 22 CCR metals and Total Recoverable Petroleum Hdyrocarbons (TRPH), by U.S EPA Methods 6000/7000 series and 418.1

TABLE 3
Analytical Results for Closure Samples
Sumps, Drains and Clairfiers

LOCATION	Closure Sampling Points	Sample Depth (feet below ground surface)	Petroleum Hydrocarbons			Aromatic Compounds				Volatile Organic Compounds										
			TPH C4-C12	TPH C13-C22	TPH C23+	Benzene	Toluene	Ethyl benzene	Xylenes	Chloro form	Methylene Chloride	1,2,4 TMB	1,3,5 TMB	Form.	pH	Phosphate	Chloride	Ammonia	MBAS	Other Analytes
			Method 8015FC	Method 8015FC	Method 8015FC	Method 8020	Method 8020	Method 8020	Method 8020	Method 8260	Method 8260	Method 8260	Method 8260	Method 8315	Method 9045	Method 365.2m	Method 300.1	Method 350.2m	Method 425.1m	Method Various
			(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	units	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Practical Quantitation Limit			0.5	10	10	0.005	0.005	0.005	0.01	0.005	0.01	0.005	0.005	2		0.5	10	10	1	Various
PRG						3.2	2800	890	990	1.1	25			100,000						
CCR Title 22 66261.22/.24						0.5mg/l				6mg/l					<2 or >12.5					
CCR Appendix 10 Constituent						YES	YES	YES	YES	YES	YES			YES						
RWQCB Screening Levels			500	1000	10,000	0.054	2.75	10.7	29	1.75	0.054	18.8	18.8	59			2688	484	5.4	
SUMPS																				
Pump sump next to the NW Corner of Bldg. 2 and the bleach tank.	None	None																		
Polydrum sump, NE corner of BLDG 2	B (6)	None																		
Sump east of Bldg. 4 and old cooling tower	C-1	3																ND		
Drain sump by Bldg. 15	D	7	ND	ND	ND					ND	ND	ND	ND							
Alkane unloading sump	E	None																		
Sump due South of BLDG 4 and North of RR tracks	F	None																		
Sump within Area III, Oleum AGT Containment area	G-1 liquid(4)	4	ND	ND	ND										8.1 10.11(4)	1.2 30(4)	30 500(4)	12(4)	ND 780(4)	
Sump east of Bldg. 1 and north of Area II AGTs	B1-H	4.5															330			
Pump sump NW corner Bldg. 2 chlorine tank	CT-I	4															46			
Soda Ash Unloading Sump between Bldgs. 4 and 8	JN JS	9 9													9.4 10.2					
Bldg. 5 Spray Dryer and main sump	K L M	4 4 4													9.5 10.1 8.9				27 78 13	
Sump north of Area V, AGTs and adjacent to weigh station	S-N.3		ND	ND	ND										8.2		22	ND		
Sump south of Area V, AGTs.	O-M (1)	5	0.64	10	ND										9.6		90	ND		PCBs 0.08
Drainage Sump for Area V	O-SE (1)	5	ND	ND	ND										6.8		200	ND		ND(0.04)

TABLE 3
Analytical Results for Closure Samples
Sumps, Drains and Clairfiers

LOCATION	Closure Sampling Points	Sample Depth (feet below ground surface)	Petroleum Hydrocarbons			Aromatic Compounds				Volatile Organic Compounds											
			TPH C4-C12	TPH C13-C22	TPH C23+	Benzene	Toluene	Ethyl benzene	Xylenes	Chloro form	Methylene Chloride	1,2,4 TMB	1,3,5 TMB	Form.	pH	Phosphate	Chloride	Ammonia	MBAS	Other Analytes
			Method 8015FC	Method 8015FC	Method 8015FC	Method 8020	Method 8020	Method 8020	Method 8020	Method 8260	Method 8260	Method 8260	Method 8260	Method 8315	Method 9045	Method 365.2m	Method 300.1	Method 350.2m	Method 425.1m	Method Various
			(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	units	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Practical Quantitation Limit			0.5	10	10	0.005	0.005	0.005	0.01	0.005	0.01	0.005	0.005	2		0.5	10	10	1	Various
PRG						3.2	2800	890	990	1.1	25			100,000						
CCR Title 22 66261.22/.24						0.5mg/l				6mg/l					<2 or >12.5					
CCR Appendix 10 Constituent						YES	YES	YES	YES	YES	YES			YES						
RWQCB Screening Levels			500	1000	10,000	0.054	2.75	10.7	29	1.75	0.054	18.8	18.8	59			2688	484	5.4	
Sump inside Bldg. 8, NE Corner	SP.A	1	1.8	ND	3.2										8.8		100	28		
	SP.3	3	0.65	11	ND										8.9		180	73		
Sump inside Bldg. 6 Boiler Room	ZZ	3																	81	
Sump inside Bldg. 8, Central next to Oleum Tanks	ZX-1	6													7.8					
	ZX-2	3													7.8					
	ZX-3	3													7.5					
	ZX-4	3													8.6					
Caustic Unloading Sump Due North of Bldg. 6	HA-10	5													11.6					
CLARIFIERS																				
Clarifier between Bldgs. 2 and 14	Q-E	8								0.11	ND	ND	ND							
	Q-W	8								0.059	0.026	ND	ND							
Main Clarifier preceeding sewer discharge, south gate	R1	16	ND	49	ND					ND	ND	0.65	0.19		10.1	ND	85		230	
	R2	16	0.81	13	ND					ND	ND	ND	ND		9.9	ND	43		47	
Clarifier North of storm water retention tanks	S	10	0.58	170	ND					ND(<0.5)	ND(<0.5)	ND(<0.2)	ND(<0.2)		8.4	0.54	110		310	
	Sw	8	1.5	200	ND					ND(<0.2)	ND(<0.2)	ND(<0.1)	ND(<0.1)		8.7	3.1	200		57	
Clarifier southeast corner of Bldg. 15	T	8	ND	ND	ND					ND	ND	ND	ND							
Clarifier east of Bldg. 8	U-1	6.5	ND	ND	ND										8.1		110	ND		
	U-2	6	ND	ND	ND										8.2		75	ND		
	U-3	5.5	ND	ND	ND										8.3		150	ND		
DRAINS																				
Trench drain between Bldgs. 1 and 14	VD.3	4								0.054	ND	ND	ND	2.7			330	ND		
	V-N	6								0.033	ND	ND	ND	ND			55	ND		
	V-NM	8.5								ND	ND	ND	ND	ND			580	ND		

TABLE 3
Analytical Results for Closure Samples
Sumps, Drains and Clairfiers

LOCATION	Closure Sampling Points	Sample Depth (feet below ground surface)	Petroleum Hydrocarbons			Aromatic Compounds				Volatile Organic Compounds										
			TPH C4-C12	TPH C13-C22	TPH C23+	Benzene	Toluene	Ethyl benzene	Xylenes	Chloro form	Methylene Chloride	1,2,4 TMB	1,3,5 TMB	Form.	pH	Phosphate	Chloride	Ammonia	MBAS	Other Analytes
			Method 8015FC	Method 8015FC	Method 8015FC	Method 8020	Method 8020	Method 8020	Method 8020	Method 8260	Method 8260	Method 8260	Method 8260	Method 8315	Method 9045	Method 365.2m	Method 300.1	Method 350.2m	Method 425.1m	Method Various
			(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	units	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Practical Quantitation Limit			0.5	10	10	0.005	0.005	0.005	0.01	0.005	0.01	0.005	0.005	2		0.5	10	10	1	Various
PRG						3.2	2800	690	990	1.1	25			100,000						
CCR Title 22 66261.22/.24						0.5mg/l				6mg/l					<2 or >12.5					
CCR Appendix 10 Constituent						YES	YES	YES	YES	YES	YES			YES						
RWQCB Screening Levels			500	1000	10,000	0.054	2.75	10.7	29	1.75	0.054	18.8	18.8	59			2688	484	5.4	
	V-SM	6.5								ND	0.012	ND	ND	ND			3000	ND		
	V-S	6.5								ND	ND	ND	ND	ND			44	ND		
Drain east of Area V, AGTs and the Formaldehyde tanks	W	None																		
Sump east of Bldg. 4 and old cooling tower	X-1.3	3																ND		
Storm drain near south gate	Y.3	3								ND	ND	ND	ND		9					
Storm drains outside of	Z.3	3	ND	ND	ND										8.2		52		19	
Bldg. 6	A1	3	ND	ND	26										8.6		490		2.8	
	B1	3	ND	ND	ND										9.3		130		2.8	
	C1	3	0.78	48	76										10.1		140		5	
Storm drains southwest of	DI-1	3													9.2		100			
Bldg. 1	EI-1	3													9.8		110			
Storm drains north of Bldg. 7	F.1	3													8.3	ND			5.6	
	G.1	3													8.9	ND			2	
	H.1	3													8.7	ND			410	
	GH.3	3	ND	ND	ND															
Bldg. 5 floor drain	I1-A	4													8		330		6.1	
	I1-B	4													9.4		170		43	
	I1-C	4													9.2		320		2.8	
	I1-D	4													7.5		350		87	
Bldg. 8 trench drain	J.1.N	6	ND	ND	ND										8.4		110	ND		
	J.1.MID	6	ND	ND	ND										7.7		36	ND		
	J.1.S	5	ND	ND	ND										8.8		510	ND		
Storm drain east of Bldg. 14	K1	3													8.9		45			
CLOSURE EXCAVATION STOCKPILES																				
Clarifier Between Bldg 2 and 14 (Closure Samples QE and QW)	K-1,2,3,4(2)	2 (3)																		130 (TRPH) Title 22 Metals

TABLE 3
Analytical Results for Closure Samples
Sumps, Drains and Clairfiers

LOCATION	Closure Sampling Points	Sample Depth (feet below ground surface)	Petroleum Hydrocarbons			Aromatic Compounds				Volatile Organic Compounds											
			TPH C4-C12	TPH C13-C22	TPH C23+	Benzene	Toluene	Ethyl benzene	Xylenes	Chloro form	Methylene Chloride	1,2,4 TMB	1,3,5 TMB	Form.	pH	Phosphate	Chloride	Ammonia	MBAS	Other Analytes
			Method 8015FC	Method 8015FC	Method 8015FC	Method 8020	Method 8020	Method 8020	Method 8020	Method 8260	Method 8260	Method 8260	Method 8260	Method 8315	Method 9045	Method 365.2m	Method 300.1	Method 350.2m	Method 425.1m	Method Various
			(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	units	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Practical Quantitation Limit			0.5	10	10	0.005	0.005	0.005	0.01	0.005	0.01	0.005	0.005	2		0.5	10	10	1	Various
PRG						3.2	2800	890	990	1.1	25			100,000						
CCR Title 22 66261.22/.24						0.5mg/l				6mg/l					<2 or >12.5					
CCR Appendix 10 Constituent						YES	YES	YES	YES	YES	YES			YES						
RWQCB Screening Levels			500	1000	10,000	0.054	2.75	10.7	29	1.75	0.054	18.8	18.8	59			2688	484	5.4	
Main Clarifier preceeding sewer discharge, south gate (Closure Samples R-1 and R-2)	**R-SP 1, (2) 2,3 and 4**	2	**ND**	**ND**	**21**					**ND**	**ND**	**ND**	**ND**		**9.6(5)**	**ND**	**48.7(5)**		**54.3(5)**	
Sump inside Bldg. 8, Central next to Oleum Tanks (Closure Sample ZX)	**ZX-SP-1**	2													**7.1**					
Sump within Area III, Oleum AGT Containment area (Closure Sample G)	**G-SP-1**	2													**6.9**					

NOTES

Refer to Drawing 1 for sample locations.
ALL Methods shown are U.S. EPA Methods unless otherwise listed.
ND = Not detected at the practical quantitation limit.
ND(<50) = Not detected at an elevated method detection limit shown in parenthesis. Elevated limits due to matrix interfearences.
None = No Sample Collected for this Waste Management Unit
PRG = Preliminary remediation Goal, U. S EPA Region IX, September, 1995, for industrial soils.

TPH-FC = Total Petroleum Hydrocarbons, Fuel Fingerprint
1,2,4 TMB = 1,2,4 Trimethylbenzene
1,3,5 TMB = 1,3,5 Trimethylbenzene
Form = Formaldehyde
MBAS = Methylene Blue Active Substances

(1) Sample additionally analyzed for PCBs by U.S EPA Method 8080.
(2) Stockpile samples from remedial excavation activities were additionally analyzed for 22 CCR metals and Total Recoverable Petroleum Hdyrocarbons (TRPH), by U.S EPA Methods 6000/7000 series and 418.1
(3) Soil samples were collected approximately 2 feet into the stockpile.
(4) Liquid sample from fluid that was released into the sump pit upon removal of the conveyance piping.
(5) The value reported represents the anthmetic average of the four individual samples. The samples were not composited for these analytes.
(6) The Analysis for VOCs was performed by U.S EPA method 8010.

TABLE 4
Analytical Results for Closure Samples
Underground and Above-Ground Tanks and Areas of Concern

LOCATION	Closure Sampling Points	Sample Depth (feet below ground surface)	Petroleum Hydrocarbons			Aromatic Compounds				Volatile Organic Compounds										
			TPH C4-C12	TPH C13-C22	TPH C23+	Benzene	Toluene	Ethyl benzene	Xylenes	Chloro form	Methylene Chloride	1,2,4 TMB	1,3,5 TMB	Form.	pH	Phosphate	Chloride	Ammonia	MBAS	Other Analytes
			Method 8015FC (mg/kg)	Method 8015FC (mg/kg)	Method 8015FC (mg/kg)	Method 8020 (mg/kg)	Method 8020 (mg/kg)	Method 8020 (mg/kg)	Method 8020 (mg/kg)	Method 8260 (mg/kg)	Method 8260 (mg/kg)	Method 8260 (mg/kg)	Method 8260 (mg/kg)	Method 8315 (mg/kg)	Method 9045	Method 365.2 (mg/kg)	Method 300.1 (mg/kg)	Method 350.2m (mg/kg)	Method 425.1m (mg/kg)	Method Various (mg/kg)
Practical Quantitation Limits			0.5	10	10	0.005	0.005	0.005	0.01	0.005	0.01	0.005	0.005	2		0.5	10	10	1	Various
PRG						3.2	2800	690	990	1.1	25			100,000						
CCR Title 22 66261.22/24						0.5mg/l				6mg/l					<2 or >12.5					
CCR Appendix 10 Constituent						YES	YES	YES	YES	YES	YES			YES						
RWQCB Screening Levels			500	1000	10,000	0.054	2.75	10.7	29	1.75	0.054	18.8	18.8	59			2668	464	5.4	
Underground Tanks																				
Former Diesel Tank next to Firestone Blvd. (10,000 gal.)	None																			
Former Alcohol Storage Tank south of Bldg 15. (12,000 gal.)	None																			
Former 100-gal Fuel Storage Tank below the 150,000 gallon water tank	HA-1	1	ND	ND	ND	ND	ND	ND	ND											
Former #2 Fuel Oil Tank	1A	12				ND	ND	ND	ND											(TRPH)
below the SW corner of Bldg.	1B	12				ND	ND	ND	ND											54
8 (4,200 gal.)	North	8	ND	ND	ND	ND	ND	ND	ND											12
	South	8	ND	36	ND	ND	ND	ND	ND											
	East	10	ND	150	ND	ND	ND	ND	ND											
	West	10	1.1	160	ND	ND	ND	ND	0.017											
Former Fuel (gasoline)	CB-1	5 to 50	NOT YET SAMPLED																	
Tanks adjacent to the Old	CB-2	5 to 50	NOT YET SAMPLED																	
Laboratory and Garage	CB-3	5 to 50	NOT YET SAMPLED																	
(10,000 and 550 gal.)																				
Former Diesel Tank, South-eastern corner of the Site (10,000 gal.)	None																			
Former Brine Tank between	BT-A	8	ND	ND	ND										9.6	1.4	50			
RR tracks and west of	BT-B	8	ND	ND	ND										10	1.8	46			(TRPH)
Caustic Unloading Area	Sediment(4)					ND	ND	ND	ND	ND	ND	ND	ND		10.13					265
Former Acid Tank	B-1	6													7.4					
Containment, west of Bldg 8	B-2	6													8.4					
	B-3	6													8.2					
	B-4	6													8.4					
	S-1	3													8.4					
	S-2	3													4.3					

TABLE 4
Analytical Results for Closure Samples
Underground and Above-Ground Tanks and Areas of Concern

LOCATION	Closure Sampling Points	Sample Depth (feet below ground surface)	Petroleum Hydrocarbons			Aromatic Compounds				Volatile Organic Compounds										
			TPH C4-C12	TPH C13-C22	TPH C23+	Benzene	Toluene	Ethyl benzene	Xylenes	Chloro form	Methylene Chloride	1,2,4 TMB	1,3,5 TMB	Form.	pH	Phosphate	Chloride	Ammonia	MBAS	Other Analytes
			Method 8015FC	Method 8015FC	Method 8015FC	Method 8020	Method 8020	Method 8020	Method 8020	Method 8260	Method 8260	Method 8260	Method 8260	Method 8315	Method 9045	Method 365.2	Method 300.1	Method 350.2m	Method 425.1m	Method Various
			(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)		(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Practical Quantitation Limits			0.5	10	10	0.005	0.005	0.005	0.01	0.005	0.01	0.005	0.005	2		0.5	10	10	1	Various
PRG						3.2	2800	690	990	1.1	25			100,000						
CCR Title 22 66261.22/24						0.5mg/l				6mg/l					<2 or >12.5					
CCR Appendix 10 Constituent						YES	YES	YES	YES	YES	YES			YES						
RWQCB Screening Levels			500	1000	10,000	0.054	2.75	10.7	29	1.75	0.054	18.8	18.8	69			2688	484	5.4	
	S-3	3													7.5					
	S-4	3													7					
	S-5	5													7.8					
ABOVE-GROUND TANKS																				
AREA I - "Chloramide System" Tanks east of Building 1. (Tanks 1-5, Plate 1)	**AI-A**	4															2600			
	AI-B	4															28			
AREA II - "Raw Material Storage" Tanks west of Bldg 8 (Tanks 9 -16, Plate 1)	**AII-A**	3													8.5			ND		
	AII-B	3													7.4			ND		
AREA III - Oleum Tanks west of Bldg. 8, (Tanks 7 and 8, Plate 1)	**AIII-A**	3													8.1					
	AIII-B	3													8.3					
AREA IV - "Sulfonation Area", inside Bldg. 8, (Tanks 17-28, Plate 1)	**AIV-A**	4	ND	ND	ND										7.2		77			
	AIV-B	4	ND	ND	ND										8.8		110			
	AIV-C	4	ND	610	ND										7.2		78			
	AIV-D	4	ND	ND	ND										7.7		2000			
	AIV-E	4	ND	57	ND										7.3		340			
	AIV-F	4	ND	ND	ND										7.4		240			
AREA V - "Detergent Area", Above ground tank farm east of Bldg. 8 (Tanks 29 -46, Plate 1). Samples collected below sumps and drains in containment area	**AV-A**	5	ND	630	56									4.4	7.6		33	470	1600	
	AV-B	4	ND	120	27									50.1	6.8		120		410	
	AV-C	5	ND	ND	ND									ND	7.9		2000		9.9	
	AV-D	5	ND	ND	ND									ND	9.6		260		6.5	
	AV-E	5	ND	410	ND									10.1	8		50	120	1.3	
	AV-F	5	ND	ND	ND									2.9	9.3		310		23	
AREA VI - "Silo Storage", east of Bldg 5. (Tanks 51- 56, Plate 1)	**AVI-A**	3													7.9		86			
	AVI-B	3													9.3		280			
AREA VII - "Product Storage" inside Bldg 5 "Spray Dryer", (Tanks 57 - 70, Plate 1)	**AVII-A**	3																	37	
	AVII-B	3																	40	
	AVII-C	3																	250	

TABLE 4
Analytical Results for Closure Samples
Underground and Above-Ground Tanks and Areas of Concern

LOCATION	Closure Sampling Points	Sample Depth (feet below ground surface)	Petroleum Hydrocarbons			Aromatic Compounds				Volatile Organic Compounds											Other Analytes
			TPH C4-C12	TPH C13-C22	TPH C23+	Benzene	Toluene	Ethyl benzene	Xylenes	Chloro form	Methylene Chloride	1,2,4 TMB	1,3,5 TMB	Form.	pH	Phosphate	Chloride	Ammonia	MBAS		
			Method 8015FC	Method 8015FC	Method 8015FC	Method 8020	Method 8020	Method 8020	Method 8020	Method 8260	Method 8260	Method 8260	Method 8260	Method 8315	Method 9045	Method 365.2	Method 300.1	Method 350.2m	Method 425.1m		Method Various
			(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)		(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)		(mg/kg)
Practical Quantitation Limits			0.5	10	10	0.005	0.005	0.005	0.01	0.005	0.01	0.005	0.005	2		0.5	10	10	1		Various
PRG						3.2	2800	690	990	1.1	25			100,000							
CCR Title 22 66261.22/24						0.5mg/l				6mg/l					<2 or >12.5						
CCR Appendix 10 Constituent						YES	YES	YES	YES	YES	YES			YES							
RWQCB Screening Levels			500	1000	10,000	0.054	2.75	10.7	29	1.75	0.054	18.8	18.8	59			2688	484	5.4		
	AVII-D	3																	**85**		
	AVII-E	3																	**9.2**		
AREA VIII - "Stormwater Retention Area", SE corner of the Site, (Tanks 47 - 50, Plate 1)	**AVIII-N**	4	**ND**	**400**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**		**9.3**	**2.2**	**150**		**290**		
	AVIII-NM	4	**ND**	**460**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**		**8.7**	**2.8**	**230**		**160**		
	AVIII-MS	4	**ND**	**480**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**		**9.2**	**1.8**	**130**		**170**		
	AVIII-S	4	**ND**	**930**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**		**9.7**	**6.9**	**300**		**270**		
Former Fuel Oil and Alkane Oil Tanks west of "Storm-water Retention Area", (Tanks 0223 and 0224)	**HA-7**	6	**ND**	**3000**	**ND**																
	HA-8	6	**ND**	**17**	**ND**																
Former Cooling Tower west of the central water tank and Bldg 4 (18,000 gal.)	**None**																				
Former Caustic Tanks west Bldg 4	**None**																				
Former Chlorine Tanks inside Bldg. 3	**None**																				
AREAS of CONCERN or NEEDING ADDITIONAL ASSESSMENT																					
Lube Oil Storage Area inside Bldg 6	**HA-2**	3	**0.5**	**3200**	**5500**																**9300 (TRPH)**
Oil Stained Area South Wall Bldg 6.	**HA-3**	4	**ND**	**ND**	**ND**																
	HA-4	4	**ND**	**ND**	**ND**																
Oil Stained Area South Wall SE corner Bldg. 6	**HA-5**	3.5	**ND**	**ND**	**210**																**890 (TRPH)**
Oil Stained Area inside old Compressor Room: SE Corner Bldg. 6	**HA-6**	3.5																			**31 (TRPH)**

TABLE 4
Analytical Results for Closure Samples
Underground and Above-Ground Tanks and Areas of Concern

LOCATION	Closure Sampling Points	Sample Depth (feet below ground surface)	Petroleum Hydrocarbons			Aromatic Compounds				Volatile Organic Compounds											
			TPH C4-C12	TPH C13-C22	TPH C23+	Benzene	Toluene	Ethyl benzene	Xylenes	Chloro form	Methylene Chloride	1,2,4 TMB	1,3,5 TMB	Form.	pH	Phosphate	Chloride	Ammonia	MBAS	Other Analytes
			Method 8015FC	Method 8015FC	Method 8015FC	Method 8020	Method 8020	Method 8020	Method 8020	Method 8260	Method 8260	Method 8260	Method 8260	Method 8315	Method 9045	Method 365.2	Method 300.1	Method 350.2m	Method 425.1m	Method Various
			(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)		(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Practical Quantitation Limits			0.5	10	10	0.005	0.005	0.005	0.01	0.005	0.01	0.005	0.005	2		0.5	10	10	1	Various
PRG						3.2	2800	690	990	1.1	25			100,000						
CCR Title 22 66261.22/24						0.5mg/l				6mg/l					<2 or >12.5					
CCR Appendix 10 Constituent						YES	YES	YES	YES	YES	YES			YES						
RWQCB Screening Levels			500	1000	10,000	0.054	2.75	10.7	29	1.75	0.054	18.8	18.8	59			2688	484	5.4	
Main Clarifier at the South Gate Preceeding the Sewer Discharge	EB-1	5 to 50	NOT YET SAMPLED										X							
Equipment Cleaning Pad north side of Building 14 and the adjacent Clarifier	None																			
Drum Fluid Dispensing Area NE Corner of Bldg 2, Lab	HA-9	5	ND	ND	ND	ND	ND	ND	ND											
Maintenance Area inside Bldg 2 Lab and garage	None																			
Oil Compressor outside Bldg 7	None																			
Area indentified outside Bldg. 4 during demolition with a noticable "Diesel Odor" in the surface soils	Bldg 4A	3	0.55	13	ND															
CLOSURE and EXCAVATION STOCKPILES (3)																				(TRPH)
AREA V Soil Stockpiles from closure of Sumps within the AGT containment (Closure samples AV-A through AV-F)	N-1,2 (2)	2(3)																		320
	NSP	2(3)	0.86	200	91									6.4	8.4		320	87	25	
	E-1,2,3 (2)	2(3)																		46
	ESP	2(3)	ND	97	22									3.8	8.5		39	ND	71	
	W-1,2,3 (3)	2(3)																		310
	MSP	2(3)	ND	18	23									10.2	8.9		600		8.7	
	S-1,2,3,4 (2)	2(3)																		190
	SSP	2(3)	ND	ND	ND									11	9.8		250	92	3.7	
Brine Tank Soil Stockpiles (Closure Samples BT-A and BT-B)	BT-1	2(3)	ND	39	ND	ND	ND	ND	ND											
	BT-2	2(3)	ND	110	ND	ND	ND	ND	ND											
	BT-3	2(3)	ND	140	220	ND	ND	ND	ND											

TABLE 4
Analytical Results for Closure Samples
Underground and Above-Ground Tanks and Areas of Concern

LOCATION	Closure Sampling Points	Sample Depth (feet below ground surface)	Petroleum Hydrocarbons			Aromatic Compounds				Volatile Organic Compounds											
			TPH C4-C12	TPH C13-C22	TPH C23+	Benzene	Toluene	Ethyl benzene	Xylenes	Chloro form	Methylene Chloride	1,2,4 TMB	1,3,5 TMB	Form.	pH	Phosphate	Chloride	Ammonia	MBAS	Other Analytes
			Method 8015FC	Method 8015FC	Method 8015FC	Method 8020	Method 8020	Method 8020	Method 8020	Method 8260	Method 8260	Method 8260	Method 8260	Method 8315	Method 9045	Method 365.2	Method 300.1	Method 350.2m	Method 425.1m	Method Various
			(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)		(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Practical Quantitation Limits			0.5	10	10	0.005	0.005	0.005	0.01	0.005	0.01	0.005	0.005	2		0.5	10	10	1	Various
PRG						3.2	2800	690	990	1.1	25			100,000						
CCR Title 22 66261.22/24						0.5mg/l				6mg/l					<2 or >12.5					
CCR Appendix 10 Constituent						YES	YES	YES	YES	YES	YES			YES						
RWQCB Screening Levels			500	1000	10,000	0.054	2.75	10.7	29	1.75	0.054	18.8	18.8	59			2668	484	5.4	
	BT-4	2(3)	**ND**	**22**	**47**	**ND**	**ND**	**ND**	**ND**											
Stockpile samples from material generated as part of removal actions in the acid containment area (closure samples B-1 through B-5; S-1 through S-4)	**ST-1**	2(3)													**7.6**					
	ST-2	2(3)													**7.2**					

NOTES

Refer to Drawing 2 for sample locations

ALL Methods shown are U.S. EPA Methods unless otherwise listed.

ND(<50) = Not Detected at an elevated method detection limit shown in parenthesis. Elevated limits due to matrix interfearences

None = No Sample Collected for this UST or Area of Concern.

PRG = Preliminary Remediation Goal, U.S.EPA Region IX, September,1995, for industrial soils.

TPH-FC = Total Petroleum Hydrocarbons, Fuel Fingerprint

1,2,4 TMB = 1,2,4 Trimethylbenzene

1,3,5 TMB = 1,3,5 Trimethylbenzene

Form = Formaldehyde

MBAS = Methylene Blue Active Substances

(1) Includes Assessment samples collected subadjacent to and the Closure samples collected below the sumps , drains and clarifiers

(2) Composite stockpile samples from remedial excavation activites were additionally analyzed for 22 CCR metals and Total Recoverable Petroleum Hdyrocarbons (TRPH), by U S EPA Methods 6010/7000 series and 418.1.

(3) Soil samples were collected approximately 2 feet into the stockpile.

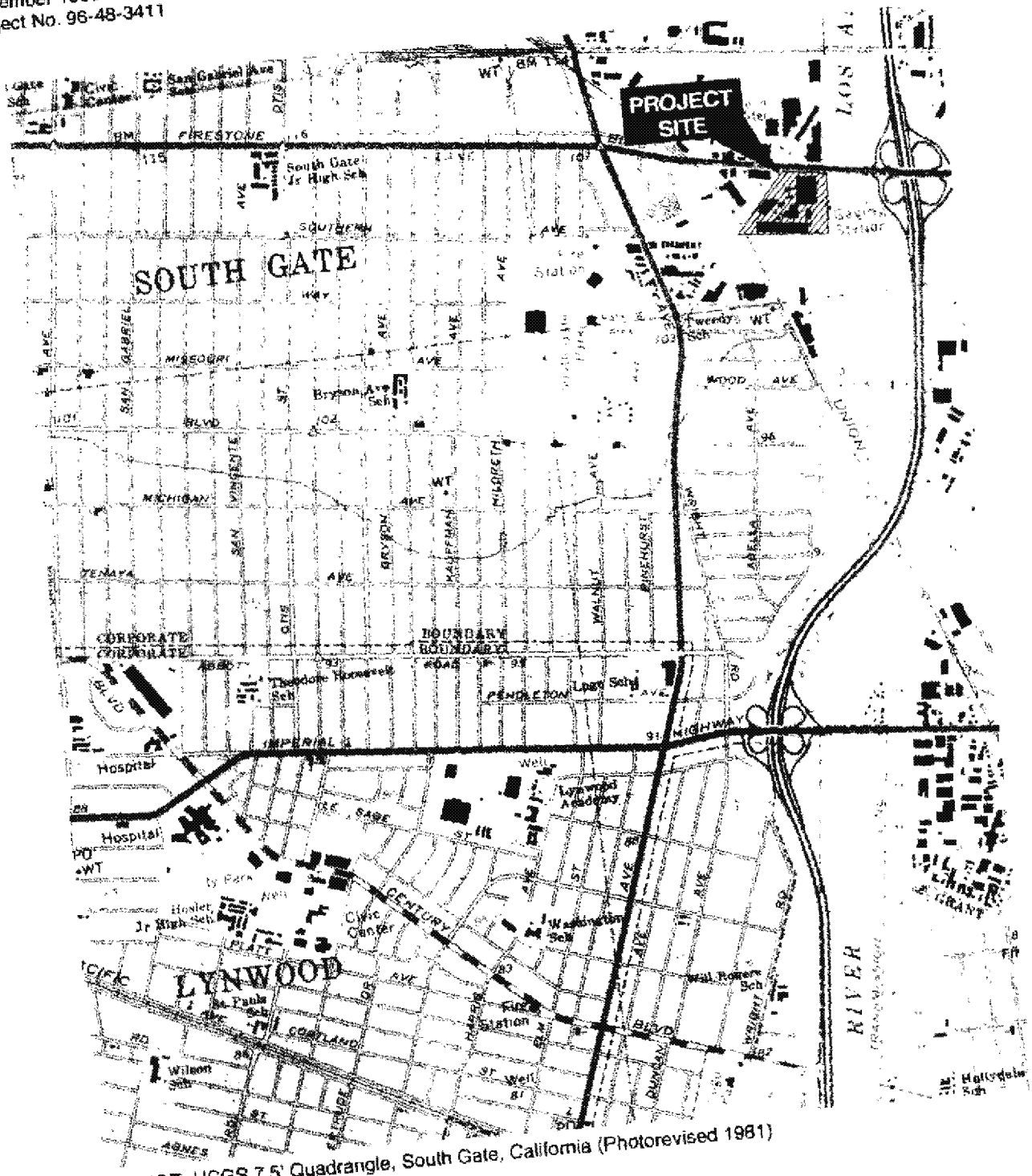
(4) Sediment sample collected from material accumulated in the Brine Tank chambers. Additional analysis included CCR Title 22 Metals. All metal concentrations were within TTLC CCR Title 22 Criteria.

FUGRO

Table 5. List Of Abbreviations

AGT	Above Ground Storage Tanks
BTEX	Benzene, Toluene, Xylenes and Ethylbenzene (i.e., petroleum aromatic compounds)
COCs	Constituents of Concern
MBAS	Methylene Blue Active Substances
PRGs	Preliminary Remediation Goals (U.S. EPA Region IX)
RWQCB	Regional Water Quality Control Board - Los Angeles Region
1,2,4 TMB	1,2,4 Trimethylbenzene
1,3,5 TMB	1,3,5 Trimethylbenzene
TPH	Total Petroleum Hydrocarbons
UST	Underground Storage Tank
VOC	Volatile Organic Compounds

December 1996
Project No. 96-48-3411



SOURCE: USGS 7.5' Quadrangle, South Gate, California (Photorevised 1981)

SITE LOCATION MAP
THE DIAL CORPORATION
Main Facility
9300 Rayo Avenue
South Gate, California

FIGURE 1

December 1996
Project No. 96-48-3411

FIRESTONE AVENUE

STEEL DRAIN

PIAZZA TRUCKING 9301 RAYO AVE

RAYO AVENUE

MAIN LOT

FORMER LABORATORY

FORMER GARAGE

BUILDING 15

SURFACE DRAIN

PARKING

JEFFRIES WEBB CO OF CALIFORNIA 9361 RAYO AVE

BUILDING 1

FORMER CHLORINE TANK

BUILDING 2

BUILDING 4

AREA I

PARKING

BUILDING 1A

HA-1

WATER TANK

BLDG 4A 13

AREA II

FORMER BUILDING 3

AREA III

BUILDING 8

AREA IV

AREA V

TRANS-FORMER

ALKYLATE UNLOADING SUMP

BRINE TANK

R-1 49

R-2 13

A1 26

B1

HA-2 3200

BUILDING 6

C1 48

OIL STAINED AREA

OIL STAINED AREA

HA-3

HA-4

HA-5 210

HA-6 31

GH-3

BUILDING 7

AIV-C 610

AREA VII

AREA VI

AIV-E 67

SP.3 11

D

T

AV-B 120

AV-E 410

AV-A 630

O-M 10*

O-SE ND*

S 170

SW 200

AREA VIII

AVIII-N 400

AVIII-NW 460

AVIII-SW 480

AVIII-S 930

HA-7 3000

HA-8 17

BUILDING 5

NORTH ND

WEST 160

EAST 150

1A 54

1B 12

SOUTH 76

BUILDING 8 TANK DETAIL
NOT TO SCALE

DEPARTMENT OF WATER & POWER RIGHT-OF-WAY

20" OVERHEAD ELECTRIC

LOS ANGELES RIVER

Fugro

LEGEND

AREA II — Perimeter of AGT Sample Area.

Sample Location — AV-B | 120 — Sample With Reportable Concentration of Petroleum Hydrocarbons (C_{13}-C_{22}) in mg/kg

Sample Location — T — Sample With No Reportable Concentration Above the Practical Quantitation Limit of 10 mg/kg

Sump, Clarifier or Drain Location

Note: C_{13}-C_{22} range was depicted, because it was the most frequently reported in the samples analyzed. In addition the C_{13}-C_{22} range was the highest concentration range reported.

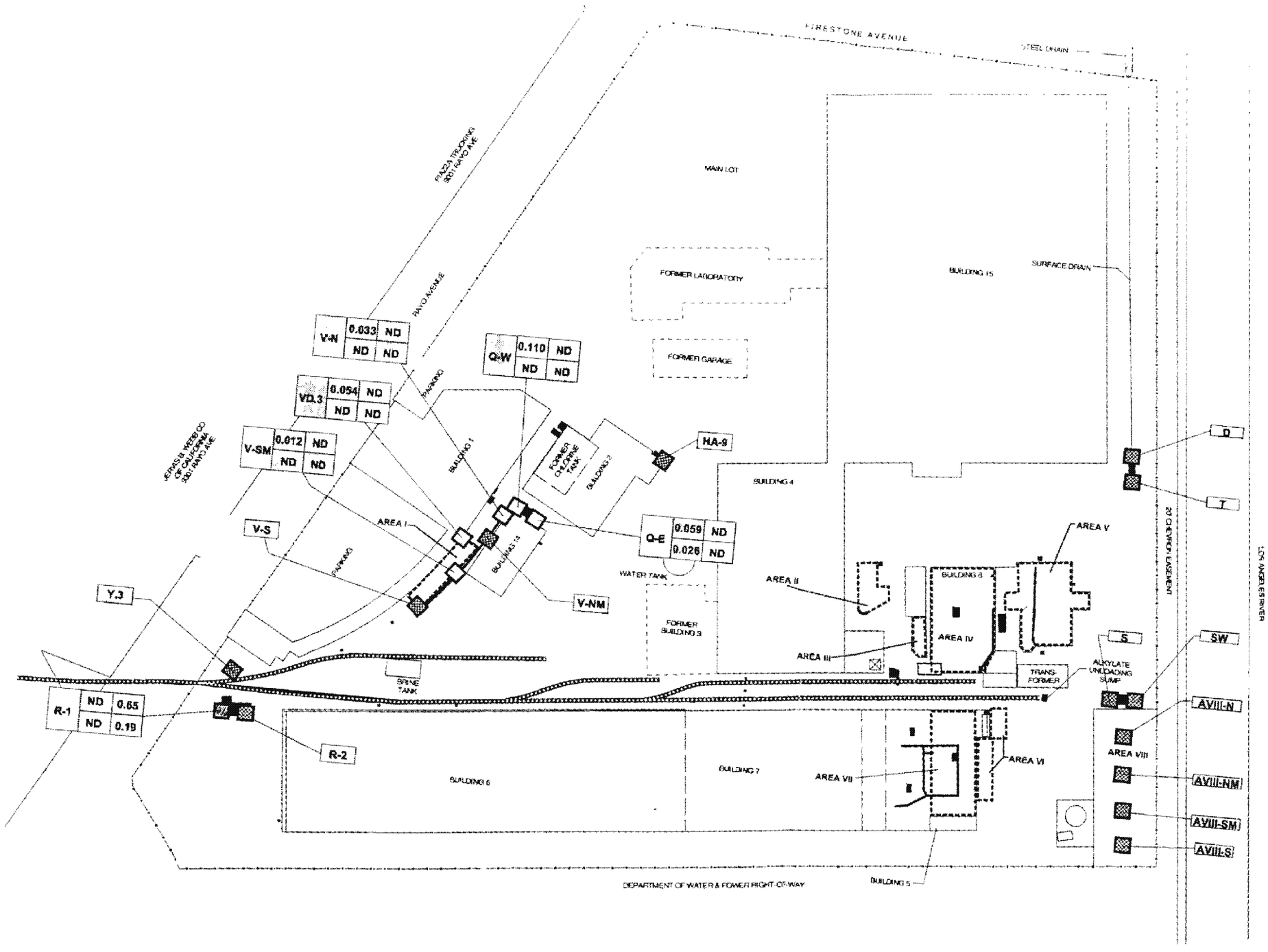
O-M | 10*
O-SE | ND*

Additionally analyzed for PCBs by U.S. EPA 8080. Sample O-M contained a reported concentration of 0.050 mg/kg Aroclor-1254.

NORTH

0 100 200
FEET

CLOSURE SAMPLE LOCATIONS AND RESULTS OF TPH ANALYSIS
THE DIAL CORPORATION
Former Bleach/Soap Manufacturing Facility
9300 Rayo Avenue
South Gate, California



LEGEND

AREA II — Perimeter of AGT Sample Area

Sampling Location — Q-E (CHLOROFORM (mg/kg); 1,2,4 Trimethy-Benzene (mg/kg); Methylene Chloride (mg/kg); 1,3,5 Trimethy-Benzene (mg/kg)) — Sample With Reportable Concentrations of Volatile Organic Compounds. ND = Not Detected Above Practical Quantitative Limit of 0.005 to 0.010 mg/kg.

Sampling Location — T — Sample With No Reportable Concentration of Volatile Organic Compounds Above the Practical Quantitative Limit of 0.005 to 0.020 mg/kg

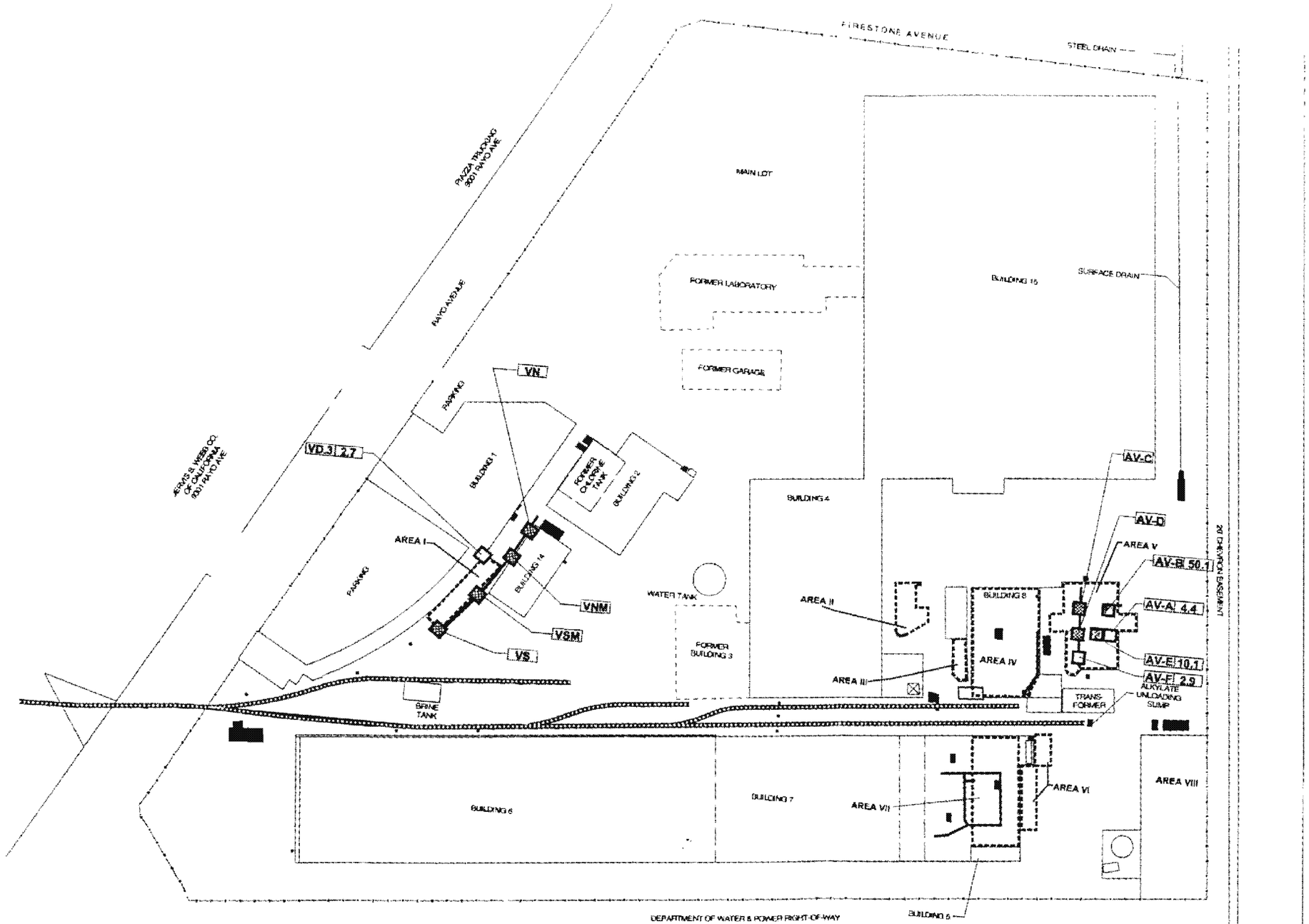
Sump, Clarifier or Drain Location.

NORTH

0 100 200
FEET

CLOSURE SAMPLE LOCATIONS AND RESULTS OF ANALYSIS FOR VOLATILE ORGANIC COMPOUNDS
THE DIAL CORPORATION
Former Bleach/Soap Manufacturing Facility
9300 Rayo Avenue
South Gate, California

FUGRO



LEGEND

AREA II — Perimeter of AGT Sample Area

Sample Location — AV-B | 50.1 — Sample With Reportable Concentration of Formaldehyde (CH_2O) in mg/kg (parts per million)

Sample Location — VN — Sample With No Reportable Concentration of Formaldehyde (CH_2O) Above the Practical Quantitative Limit of 2 mg/kg

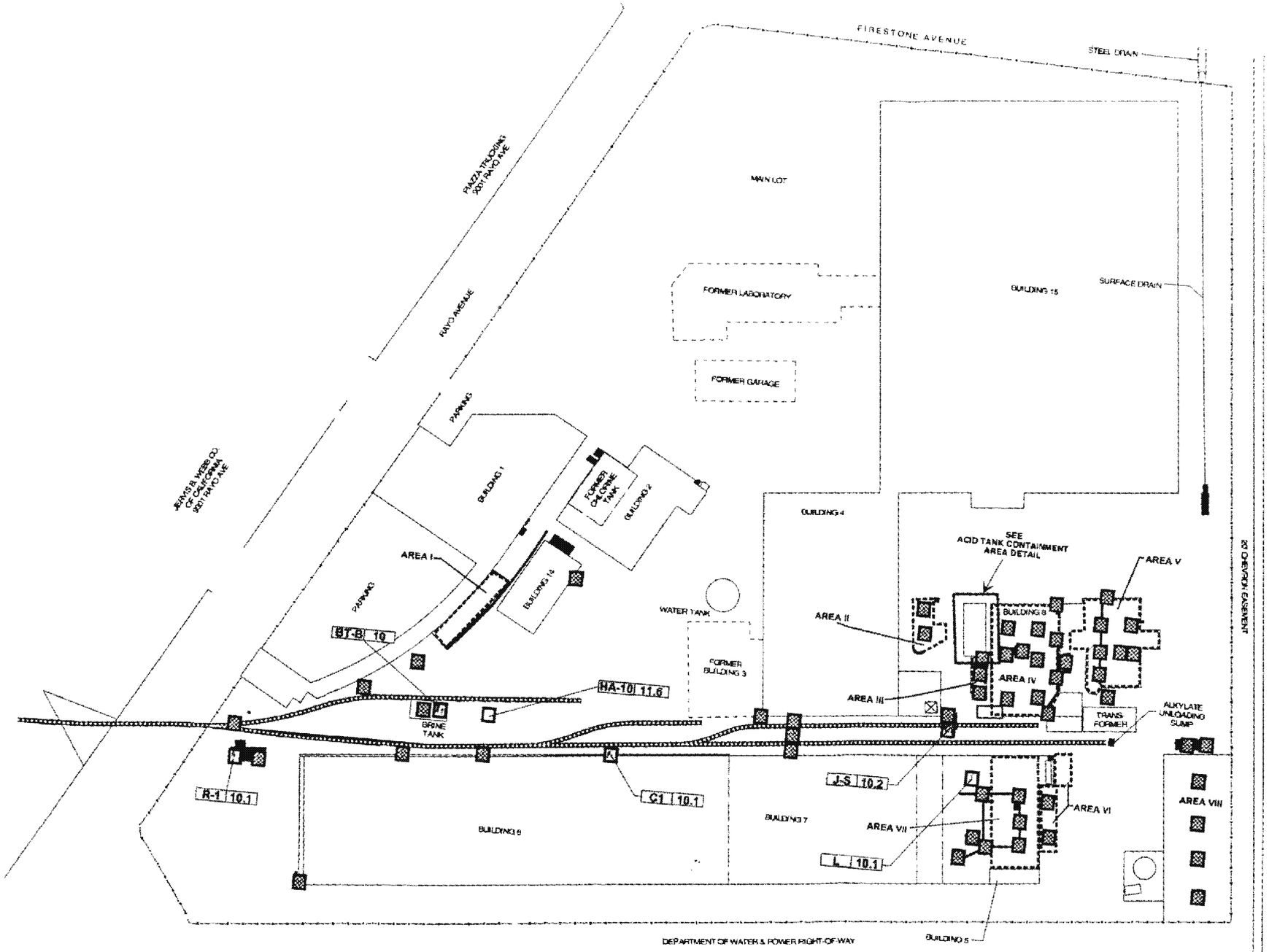
Sump, Clarifier or Drain Location

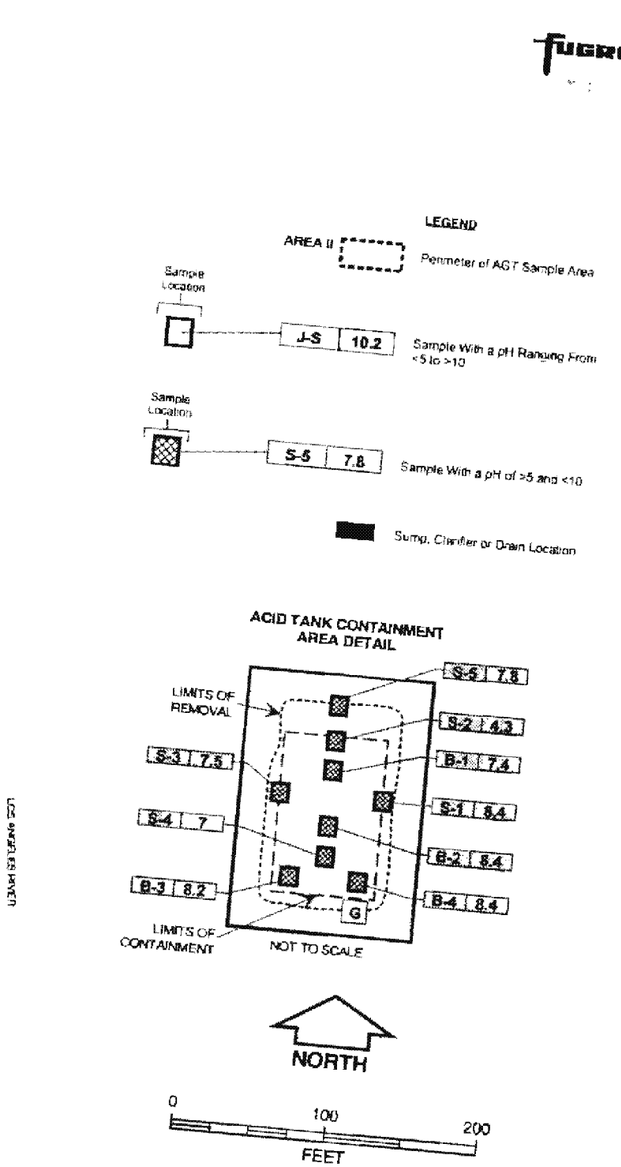
NORTH

0 100 200
FEET

CLOSURE SAMPLE LOCATIONS AND RESULTS OF ANALYSIS FOR FORMALDEHYDE
THE DIAL CORPORATION
Former Bleach/Soap Manufacturing Facility
9300 Rayo Avenue
South Gate, California

December 1996
Project No. 96-48-3411

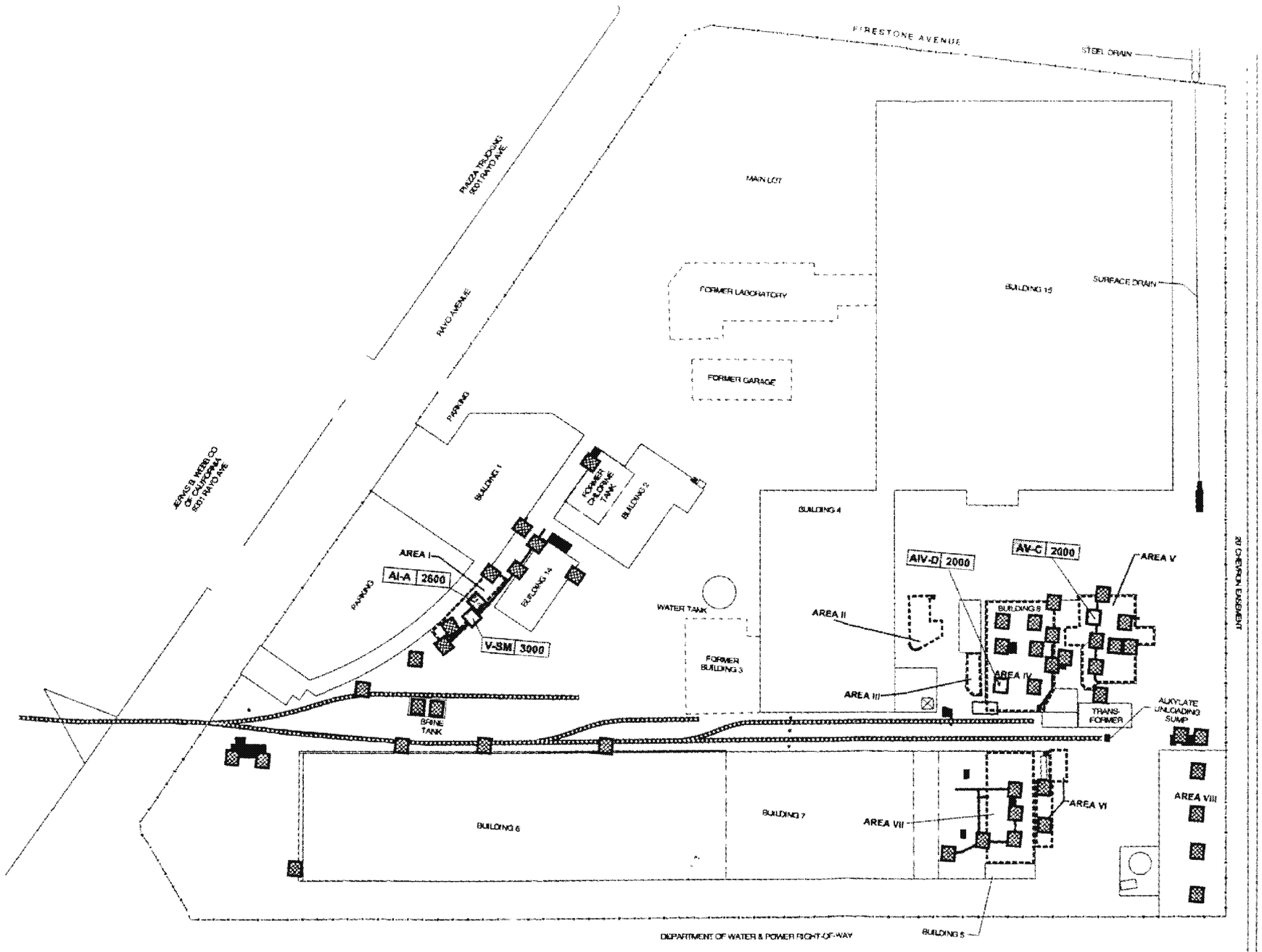




CLOSURE SAMPLE LOCATIONS AND RESULTS OF ANALYSIS FOR pH
THE DIAL CORPORATION
Former Bleach/Soap Manufacturing Facility
9300 Rayo Avenue
South Gate, California

December 1996
Project No. 96-48-3411

FUGRO



LEGEND

AREA II — Perimeter of AGT Sample Area

Sample Location — AV-C | 2000 — Sample With Chloride Concentration Equal to or Greater Than 2000 mg/kg

Sample Location — Sample With Chloride Concentration of Less Than 2000 mg/kg

Sump, Clarifier or Drain Location

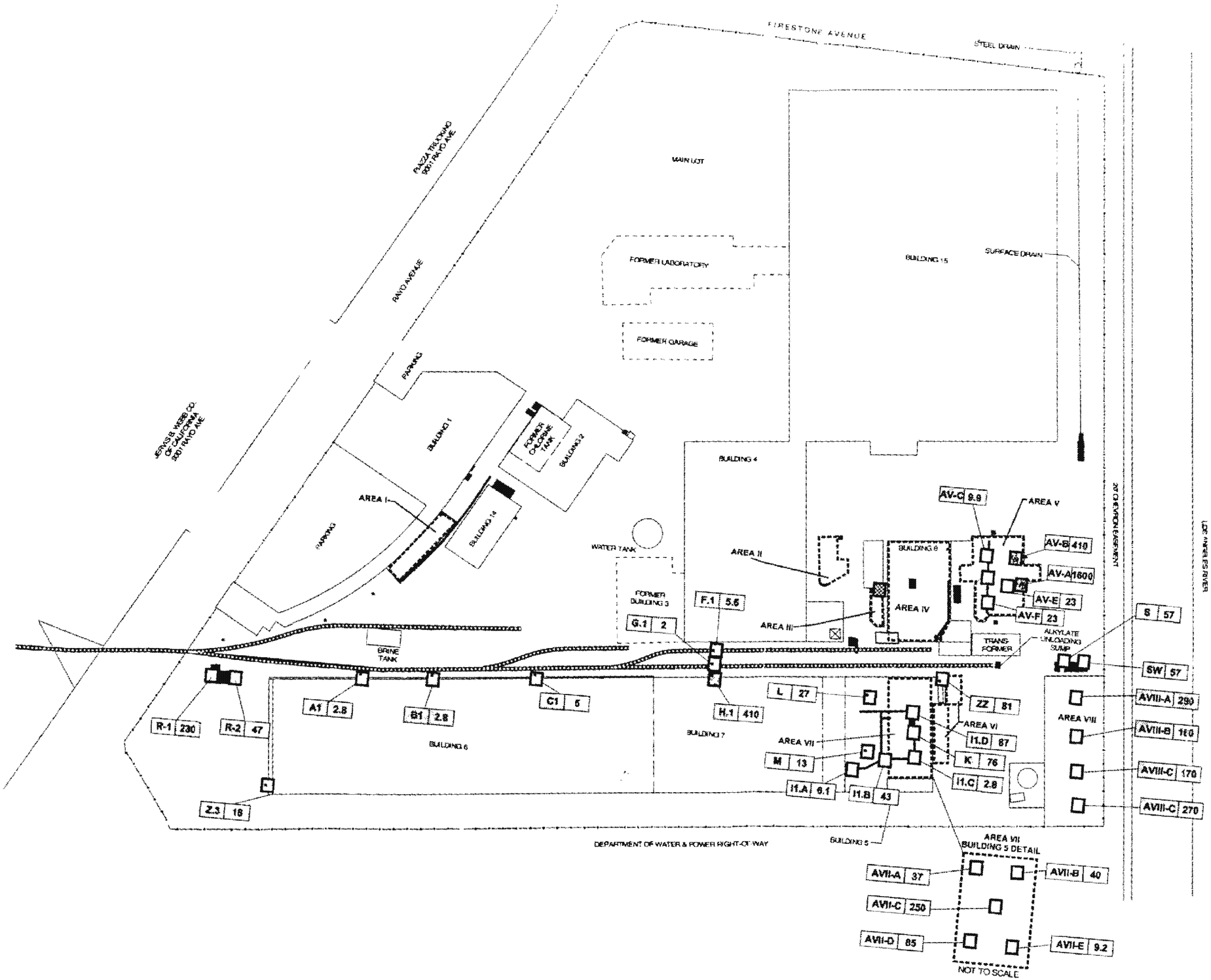
NORTH

0 100 200
FEET

CLOSURE SAMPLE LOCATIONS AND RESULTS OF CHLORIDE ANALYSIS
THE DIAL CORPORATION
Former Bleach/Soap Manufacturing Facility
9300 Rayo Avenue
South Gate, California

December 1996
Project No. 96-48-3411

FUGRO



LEGEND

AREA II — Perimeter of AGT Sample Area

Sample Location — AV-C 9.9 — Sample With Reportable Concentration

Sample Location — Sample With No Reportable Concentration Above the Practical Quantitation Limit of 1 mg/kg

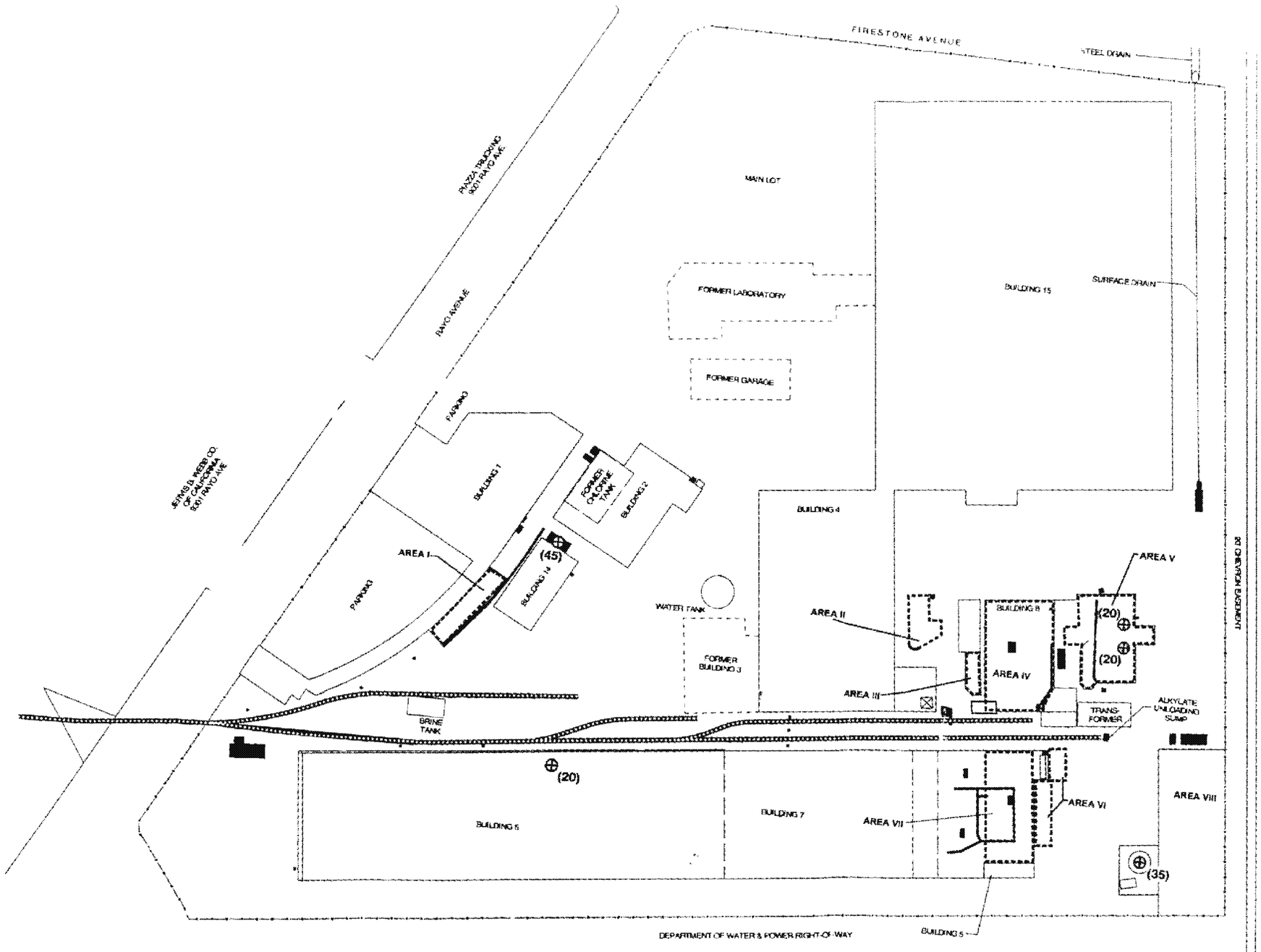
Sump, Clarifier or Drain Location

NORTH

0 100 200
FEET

CLOSURE SAMPLE LOCATIONS AND RESULTS OF MBAS ANALYSIS
THE DIAL CORPORATION
Former Bleach/Soap Manufacturing Facility
9300 Rayo Avenue
South Gate, California

December 1996
Project No. 96-48-3411



LEGEND

AREA II — Perimeter of AGT Sample Area

⊕ (35) — Proposed Boring Location and Target Depth in Feet Below Ground Surface

Sump, Clarifier or Drain Location

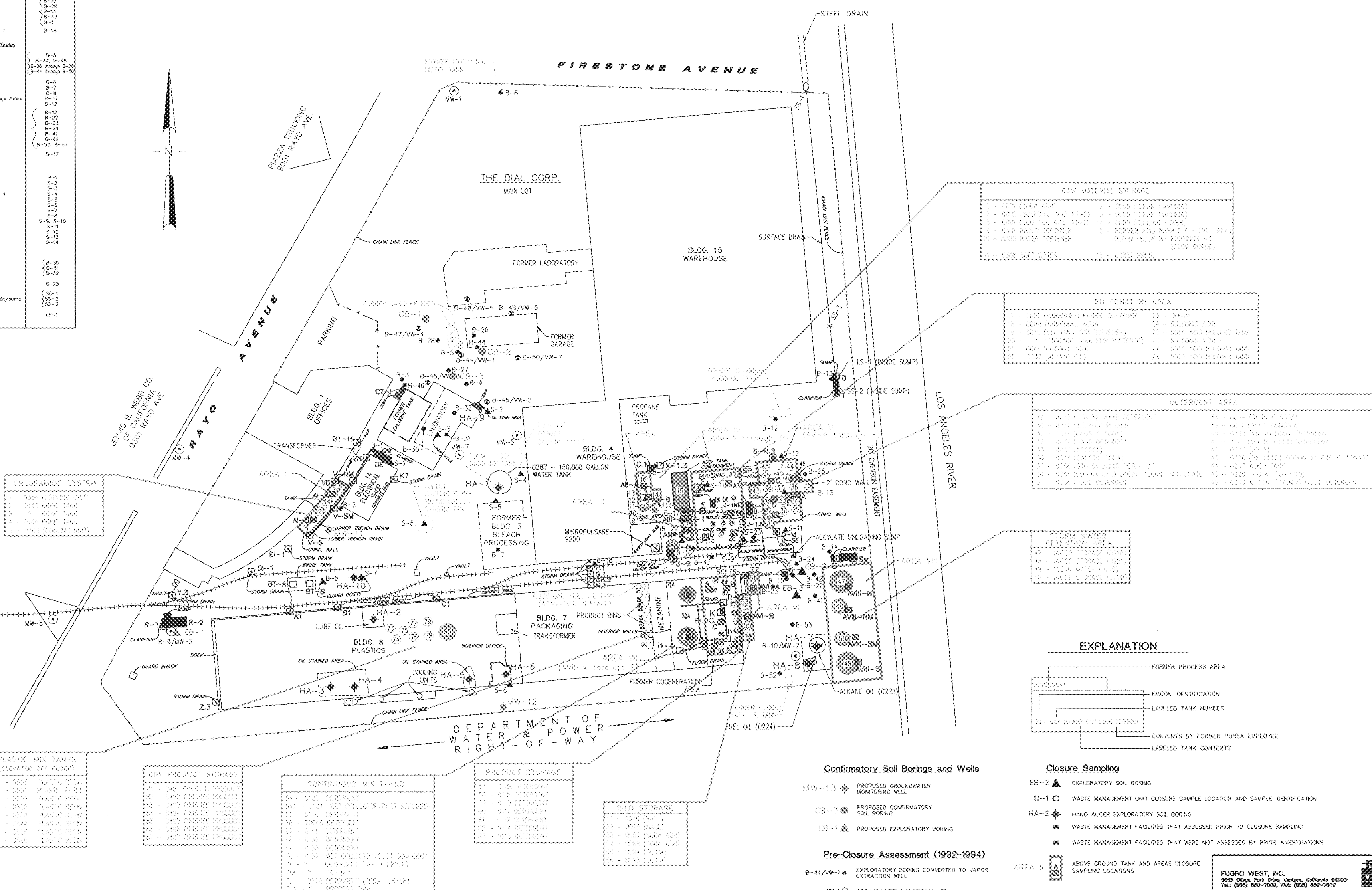
NORTH

0 100 200
FEET

PROPOSED BORING LOCATIONS
THE DIAL CORPORATION
Former Bleach/Soap Manufacturing Facility
9300 Rayo Avenue
South Gate, California

Preclosure Assessment (1992–1994)

Sample Location — Main Facility	Sample Designation
Sumps and Clarifiers	
Clarifier between Buildings 2 and 14	B-1
Trench between Buildings 1 and 14	B-2
Pump sump next to the Building 2 bleach tank	B-3
Poly drum sump north of Building 2 lab	B-4
Clarifiers near south gate(s)	B-9
Sump east of Building 4 and old cooling tower	B-11
Drain sump by Building 15	B-13
Clarifier near stormwater retention tanks	B-14
Alkylate unloading sump	B-15, B-29, B-15, B-43, H-1
Stormwater sumps north of Buildings 6 and 7	B-16
Underground and Aboveground Storage Tanks	
Former gasoline USTs near old garage area	B-5, H-44, H-46, B-26 through B-28, B-44 through B-50
Former diesel tank next to Firestone Blvd.	B-6
Former chlorine tanks	B-7
Salt brine tanks along railroad track	B-8
Former alkane and diesel underground storage tanks	B-10
Former alcohol tank	B-12
Former #2 fuel oil tank under Building 8	B-18, B-22, B-23, B-24, B-41, B-42, B-52, B-53
Above ground tank area east of Building 6	B-17
Shallow Sampling Locations	
Equipment cleaning pad by building 14	S-1
Drum fluid dispensing area by building 2	S-2
Maintenance area building 2	S-3
Four former storage tanks west of building 4	S-4
Four former storage tanks by building 4	S-5
Old cooling tower west of building 4	S-6
Caustic unloading area north of building 6	S-7
Oil compressor near building 7	S-8
Inside building 8	S-9, S-10
Adjacent to electric substation	S-11
Formaldehyde area	S-12
Above ground tank area west of building 8	S-13
Old cooling tower east of building 4	S-14
Other Boring/Sampling Locations	
Building 2 Maintenance Area	B-30, B-31, B-32
Formaldehyde Drum Area	B-25
Sludge sample from Dial facility surface drain/sump	SS-1, SS-2, SS-3
Liquid sample from Dial facility sump	LS-1



EXPLANATION

- FORMER PROCESS AREA
- EMCON IDENTIFICATION
- LABELED TANK NUMBER
- CONTENTS BY FORMER PUREX EMPLOYEE
- LABELED TANK CONTENTS

Confirmatory Soil Borings and Wells

- MW-13 — PROPOSED GROUNDWATER MONITORING WELL
- CB-3 — PROPOSED CONFIRMATORY SOIL BORING
- EB-1 — PROPOSED EXPLORATORY BORING

Pre-Closure Assessment (1992-1994)

- B-44/VW-1 — EXPLORATORY BORING CONVERTED TO VAPOR EXTRACTION WELL
- MW-1 — GROUNDWATER MONITORING WELL
- B-1 — EXPLORATORY SOIL BORING
- H-1, H-44, H-46 — HAND AUGER BORING
- S-1 — SURFACE SAMPLE LOCATION
- SS-1 X — SLUDGE SAMPLE
- LS-1 — LIQUID SAMPLE

Closure Sampling

- EB-2 — EXPLORATORY SOIL BORING
- U-1 — WASTE MANAGEMENT UNIT CLOSURE SAMPLE LOCATION AND SAMPLE IDENTIFICATION
- HA-2 — HAND AUGER EXPLORATORY SOIL BORING
- WASTE MANAGEMENT FACILITIES THAT ASSESSED PRIOR TO CLOSURE SAMPLING
- WASTE MANAGEMENT FACILITIES THAT WERE NOT ASSESSED BY PRIOR INVESTIGATIONS
- AREA II — ABOVE GROUND TANK AND AREAS CLOSURE SAMPLING LOCATIONS

BENCHMARK:

CITY OF SOUTHGATE BENCHMARK
THE TOP OF A WATER VALVE HANDHOLE IN THE ASPHALT PARKING LOT AT THE SOUTHWEST CORNER OF RAYO AVENUE AND SOUTHERN AVENUE.
ELEVATION = 104.986

GRAPHIC SCALE
(IN FEET)
1 inch = 50 ft.

REVISIONS		
DATE	DESCRIPTION	BY

DRAWN BY:	CHECKED BY:	APPROVED BY:
L.K.	M.F.	

FUGRO WEST, INC.
5855 Olivas Park Drive, Ventura, California 93003
Tel.: (805) 650-7000, FAX: (805) 650-7010

SITE PLAN

Client: The Dial Corporation, 9300 Rayo Avenue

96-48-3411 December 1996 PLATE 1

APPENDIX A
LIMITATIONS

APPENDIX A
LIMITATIONS

This report has been prepared for the RWQCB, Los Angeles Region, on behalf of our client, The Dial Corporation, as a progress report for closure activities at the facility at 9300 Rayo Avenue, in Southgate, California. In performing our professional services, we have applied present engineering and scientific judgment and used a level of effort consistent with the standard of practice measured on the date of the work and in the local of the project site for similar type studies. Fugro West, Inc., does not guarantee the accuracy or completeness of data collected by third parties. Fugro West, Inc., makes no warranty, express or implied, concerning any of the materials or services furnished.

The analyses and interpretations in this report have been developed, based on review of existing information pertaining to the site and review of analytical results from ground water samples collected from discrete locations. It should be recognized that subsurface soil and groundwater can vary laterally and with depth below a given site, and that contamination can go undetected in any limited subsurface investigation.

APPENDIX B
CLOSURE PLAN PROCEDURES

APPENDIX B
CLOSURE PLAN PROCEDURES

This appendix provides a description of general field procedures used during the closure sampling program. Closure samples were either collected using hand-auger equipment or with the aid of excavation equipment. Procedures for soil sample collection are provided below.

Excavation Soil Sampling

Excavation samples were collected either by driving a stainless steel sample tube directly into freshly uncovered soil, or into soil contained in the backhoe bucket. If collected from the backhoe bucket, a relatively coherent and undisturbed portion of soil within the bucket was selected and a stainless steel tube was driven into the soil. The sample tube was then removed, and the ends were covered with Teflon sheeting and sealed with airtight caps.

Samples were labeled, documented in the chain-of-custody record, and placed in a cooler with ice at approximately 4°C prior to laboratory analysis. Selected samples were delivered to an onsite state-certified mobile laboratory for analysis, as outlined in the text of the report. Samples not selected for immediate analysis were transported in a cooler with ice and archived in a frostless refrigerator at approximately 4°C for possible future testing.

Prior to use, the sampler and sampling tubes were thoroughly cleaned to avoid cross contamination. Sampling equipment was brush-scrubbed in a Liquinox and potable water solution and rinsed twice in clean potable water.

Hand-Auger Sampling

Each hand auger boring was drilled using a 3-inch-diameter earth auger attached to a 3-foot-long T-bar that is operated manually. Soil samples were collected using a sampling device consisting of a steel penetration shoe attached to a 0.75-inch diameter steel rod and sliding hammer. The shoe was equipped with a stainless-steel sample retention liner approximately 4 inches long and 2 inches in diameter. To collect samples, the shoe and the liner were driven with the sliding hammer into the undisturbed soil at the bottom of the borehole. After the sampler was driven approximately 4 inches, the shoe was removed from the boring and the sample liner was removed from the shoe and sealed on both ends with Teflon tape and plastic end caps. The samples were retained for laboratory analysis. The hand auger and sampling equipment was washed in a nonphosphatic cleaning solution and rinsed with deionized water prior to each sampling episode. Upon completion of the sampling, each boring was backfilled with excavated soils.

Chain-of-Custody Protocol

Chain-of-custody protocol was followed for all soil samples selected for laboratory analysis. The chain-of-custody forms accompanied the samples from the sampling locality to the laboratory, providing a continuous record of possession prior to analysis.

APPENDIX C
SOIL CLEANUP LEVEL ESTIMATES

APPENDIX C
SOIL CLEANUP LEVEL ESTIMATES

Table 4-1 - Maximum Screening Levels (mg/kg) for TPH and BTEX Above Drinking Water Aquifers, and Table 5-1 - Average Attenuation Factors for Different Distances Above Ground Water and Lithology, and the methods described in Appendix A - Attenuation Factor Methods for VOCs in the RWQCB May 1996 document, were used to establish the screening levels for the COCs. The screening level estimates were calculated using a depth to ground water of 45 feet bgs and a separation of 30 feet between the COCs and the water table. Since most of the soil samples were collected at depths between 3 and 10 feet bgs (see Tables 3 and 4), a distance of 30 feet between the COCs reported in the soil samples and the water table is a conservative separator estimate. In calculating the attenuation factor, the soil makeup separating the COCs and the groundwater was interpreted to be 50 percent sand and 50 percent clay. Boring logs for exploratory soil borings drilled in support of the risk assessment were used, along with logs from previous assessment programs (see Appendix D for recent logs). Linear interpolation of the published criteria on Table 4-1 and 5-1 were used to establish an attenuation factor for a 30-foot separation and establish the screening level estimates for the petroleum hydrocarbons. Screening level estimates were only provided for those VOCs that were reported by the laboratory in the soil samples collected during the closure sampling performed to date.

The 1,2,4 and 1,3,5 TMB have no published toxicity information or State MCL from which to draw a PRG or calculate a screening level value. An approximation of the MCL of 1.75 µg/l was used in the screening level calculations for TMB. This value was selected because of the molecular resemblance of TMB to xylene, and the assumed similar structure activity.

Calculate, using the attenuation factor method described in the RWQCB document "Interim Assessment and Cleanup Guidebook," Appendix 4 - Attenuation Factor Method for VOCs, screening level values for:

- Chloroform
- Methylene chloride
- 1,2,4 Trimethylbenzene
- 1,3,5 Trimethylbenzene

Also adapt the method and calculate screening levels for:

- Chloride
- Ammonia
- MBAS
- Formaldehyde

Assumptions:

- Ground water is at 45 feet bgs
- There is a 30-foot separation between the COCs and ground water.
- The separating lithology is 50 percent sand and 50 percent clay.

Attenuation Factor Method:

Sand, 30 feet above ground water after RWQCB, 1996 pp A-10 and Table 5-1.

$$\left(\frac{30-20}{40-20}\right) * (3-1) + 1 = 2$$

Clay, 30 feet above ground water after RWQCB, 1996, pp A-10 and Table 5-1.

$$\left(\frac{30-20}{40-20}\right) * (26-13) + 13 = 19.5$$

For soil 50 percent sand and clay:

- $(50\% * 2) + (50\% * 19.5) = 10.75$ *voc AttenuationFactor*

Therefore, the screening level value = COC, MCL * AF (10.75)

COC	MCL (Mg/L)	AF	Screening Level (mg/kg)
Chloroform	0.100	10.75	1.075
Methylene Chloride	0.005	10.75	0.054
1,2,4 TMB	1.75	10.75	18.8
1,3,5 TMB	1.75	10.75	18.8
Chloride	250	10.75	2688
Ammonia	45	10.75	484
MBAS	0.5	10.75	5.4
Formaldehyde	5.5	10.75	59.1

Calculate the screening levels for BTEX compounds by interpolation of prescribed RWQCB values contained in Table 4-1 - Maximum Screening Levels for TPH and BTEX Above Drinking Water Aquifers.

Assumptions:

- Ground water is at 45 feet bgs;
- There is a 30-foot separation between the COCs and ground water;
- The separating lithology is 50 percent sand and 50 percent clay.

Benzene (mg/kg)

For sand:

$$\left(\frac{30-20}{80-20}\right) * (0.033-0.011) + 0.011 = 0.015$$

For clays:

$$\left(\frac{30-20}{80-20}\right) * (0.34 * 0.044) + 0.044 = 0.093$$

$$(50\% * 0.015) + (50\% * 0.093) = \underline{0.054}\ \textit{Benzene}$$

Toulene (mg/kg)

For sand:

$$\left(\frac{30-20}{80-20}\right) * (2 - 0.3) + 0.3 = 0.58$$

For clay:

$$\left(\frac{30-20}{80-20}\right) * (18 - 2.3) + 2.3 = 4.92$$

$$(50\% * 0.58) + (50\% * 4.92) = \underline{2.75}\ \textit{Toluene}$$

Ethylbenzene (mg/kg)

For sand:

$$\left(\frac{30-20}{80-20}\right) * (7-0.7) + 0.7 = 1.75$$

For clay:

$$\left(\frac{30-20}{80-20}\right) * (73-9) + 9 = 19.7$$

$$(50\% * 1.75) + (50\% * 19.7) = \underline{10.7}\ \textit{Ethylbenzene}$$

Xylenes (mg/kg):

For sand:

$$\left(\frac{30-20}{80-20}\right) * (20-1.75) + 1.75 = 4.79$$

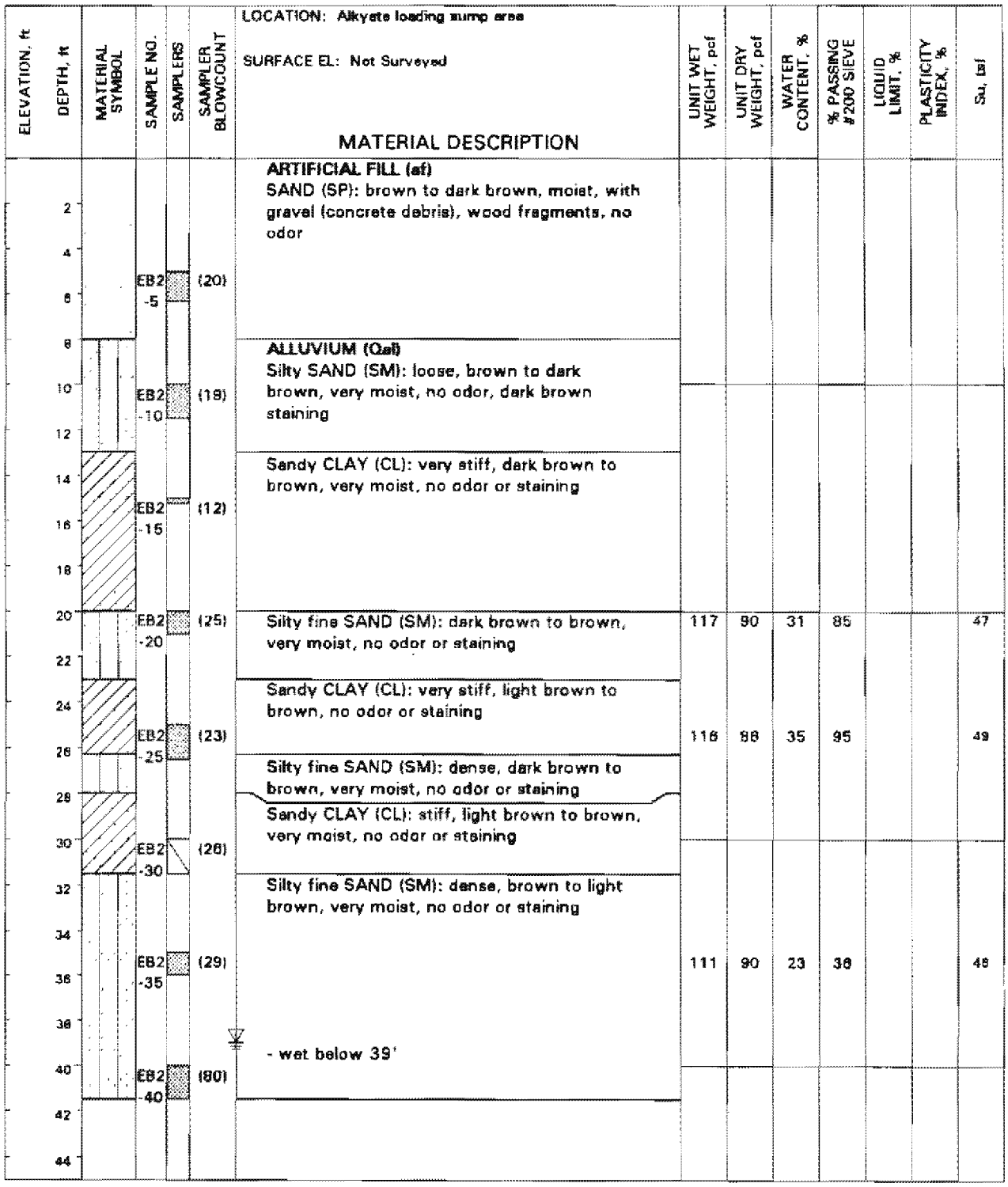
For clay:

$$\left(\frac{30-20}{80-20}\right) * (200-24.5) + 24.5 = 53.75$$

$$(50\% * 4.79) + (50\% * 53.75) = \underline{29.3}\ \textit{Xylenes}$$

APPENDIX D
LOGS OF EXPLORATORY SOIL BORINGS

December 1996
Project No. 96-48-3411



COMPLETION DEPTH: 41-1/2 ft
DEPTH TO WATER:
BACKFILLED WITH: Bentonite/Native
DRILLING DATE: September 20, 1996

DRILLING METHOD: Hollow Stem Auger
DRILLED BY: Valley Well Drilling
LOGGED BY: JRCook
CHECKED BY: MFlack

The log and data presented are a simplification of actual conditions encountered at the time of drilling at the drilled location. Subsurface conditions may differ at other locations and with the passage of time.

LOG OF DRILL HOLE NO. EB- 2
Dial Corporation

GEOT-NS(63411/EB- 2)
12/17/96\10:15

PLATE D-1

December 1996
Project No. 96-48-3411

FUGRO

LOCATION: Alkyate loading sump area

SURFACE EL: Not Surveyed

ELEVATION, ft / DEPTH, ft	MATERIAL SYMBOL	SAMPLE NO.	SAMPLERS	SAMPLER BLOWCOUNT	MATERIAL DESCRIPTION	UNIT WET WEIGHT, pcf	UNIT DRY WEIGHT, pcf	WATER CONTENT, %	% PASSING #200 SIEVE	LIQUID LIMIT, %	PLASTICITY INDEX, %	Su, tsf
2					**ARTIFICIAL FILL (af)** Silty fine SAND (SM): brown to dark brown, moist, metal, wire and wood fragments, no odor, dark brown staining							
4												
6		EB3 -5		(26)								
8					**ALLUVIUM (Qal)** Silty SAND (SM): loose, brown to dark brown, very moist, no odor, with dark brown staining							
10		EB3 -10		(9)								
12												
14		EB3 -15		(23)								
16												
18												
20		EB3 -20		(23)		119	93	28	78			45
22												
24					Sandy CLAY (CL): stiff, brown to light brown, very moist, no odor or staining							
26		EB3 -25		(15)		116	87	34	90			48
28												
30		EB3 -30		(28)	Silty fine SAND (SM): dense, brown to light brown, very moist, no odor or staining							
32												
34												
36		EB3 -35		(45)								
38												
40		EB3 -40		(70)								
42												
44												

COMPLETION DEPTH: 41-1/2 ft
DEPTH TO WATER:
BACKFILLED WITH: Bentonite/Native
DRILLING DATE: September 20, 1996

DRILLING METHOD: Hollow Stem Auger
DRILLED BY: Valley Well Drilling
LOGGED BY: JRCook
CHECKED BY: MFlack

The log and data presented are a simplification of actual conditions encountered at the time of drilling at the drilled location. Subsurface conditions may differ at other locations and with the passage of time.

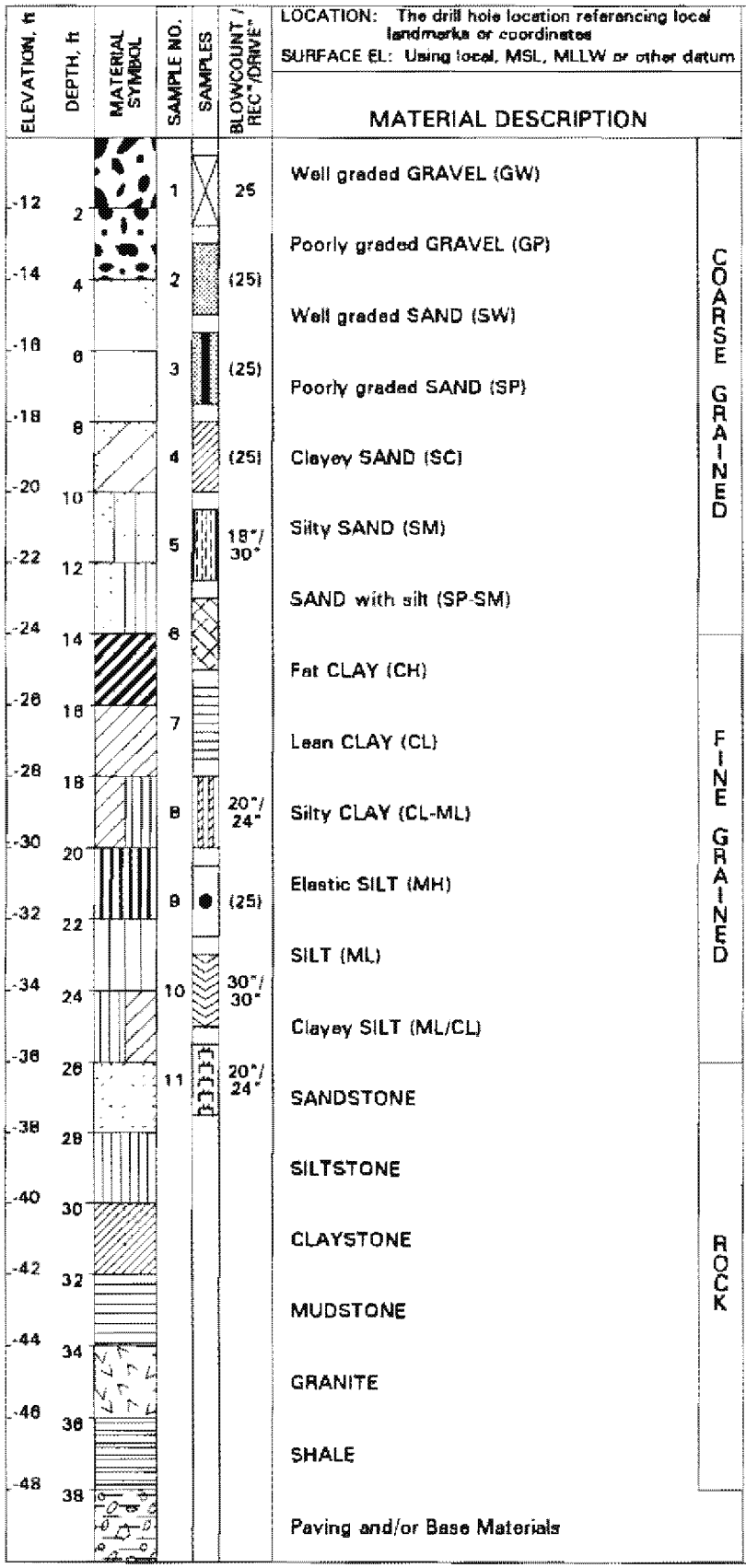
LOG OF DRILL HOLE NO. EB- 3
Dial Corporation

GEOT-NS(63411/EB- 3)
12/17/96\10:15

PLATE D-2

December 1996
Project No. 96-48-3411

FUGRO



General Notes

1 Soil Texture Symbol

2 Sloped line in symbol column indicates transitional boundary

3 Samplers and sampler dimensions (unless otherwise noted in report text) are as follows:

Symbol for:

1 SPT Sampler, driven 1 3/8" ID, 2" OD
2 CA Liner Sampler, driven 2 3/8" ID, 3" OD
3 CA Liner Sampler, disturbed 2 3/8" ID, 3" OD
4 Recovery Interval
5 Thin-walled Tube, pushed 2 7/8" ID, 3" OD
6 Bulk Bag Sample (from cuttings)
7 Hand Auger Sample
8 Rock Core Sample
9 No Sample Recovered
10 Vibracore Sample
11 Pitcher Sample

4 Sampler Driving Resistance

Number of blows with 140 lb. hammer, falling 30-in. to drive sampler 1-ft, after seating sampler 6-in.; for example,

Blows/ft	Description
25	25 blows drove sampler 12" after initial 6" of seating
86/11"	After driving sampler the initial 6" of seating, 36 blows drove sampler through the second 6" interval, and 50 blows drove the sampler 5" into the third interval
50/6"	50 blows drove sampler 6" after initial 6" of seating
Ref/3"	50 blows drove sampler 3" during initial 6" seating interval

5 Blow counts for California Liner Sampler shown in ( )

6 Length of sample symbol approximates recovery length

7 Classification of Soils per ASTM D2487 or D2488

8 Geologic Formation noted in bold font at the top of interpreted interval

9 Strength Legend

Q = Unconfined Compression
u = Unconsolidated Undrained Triaxial
t = Torvane
p = Pocket Penetrometer
m = Miniature Vane

10 Water Level Symbols

▽ Initial or perched water level
▼ Final ground water level
Seepages encountered

11 Rock Quality Designation (RQD) is the sum of recovered core pieces greater than 4 inches divided by the length of the cored interval

KEY TO TERMS & SYMBOLS USED ON LOGS

PLATE D-3

APPENDIX E
PROPOSED ADDITIONAL ASSESSMENT PROCEDURES

APPENDIX E
PROPOSED ADDITIONAL ASSESSMENT PROCEDURES

A Geoprobe® hydraulic ram and hammer unit will be used to advance six (6) pushpoints at the site to assess the extent of VOCs, petroleum hydrocarbons, formaldehyde, MBAS, and ammonia, as shown in Figure 8. The pushpoints will be advanced to depths of approximately 15 to 45 feet bgs. Soil samples will be collected beginning at depths of 10 feet bgs and thereafter at 5-foot-intervals to the total depth of each boring. The soil samples will be field-screened for chemical testing using headspace analysis and a photoionization detector. The sample sleeves retained for analysis will be sealed with Teflon sheets and plastic end caps, labeled, and placed in an ice chest pending delivery to the laboratory. Soil samples and cuttings will be logged by a Fugro Geologist using the Unified Soil Classification system described in ASTM C2487-94.

Geoprobe® sample collection equipment will be cleaned between each use with a steam cleaner and washing in a nonphosphate detergent followed by successive rinses with potable and deionized water. Each boring will be backfilled with a bentonite slurry. Soil cuttings and decontamination materials and rinsate generated from the soil, soil gas and pore water sampling operations will be contained in Department of Transportation (DOT) 17-H, 55-gallon drums pending consideration of disposal options. The drums will be labeled and stored onsite. Soil sampling data will be used to characterize the cuttings for disposal. Once the investigation-derived wastes have been characterized for disposal, they will be taken offsite to an appropriate Treatment Storage and Disposal Facility.